THE
Journal of Obstetrics & Gynaecology
of the British Empire

VOL. 55, No. 4 NEW SERIES AUGUST 1948

THE INVESTIGATION AND TREATMENT OF "BORDER-LINE" CASES OF CONTRACTED PELVIS*

BY

J. M. MUNRO KERR, M.D., F.R.C.O.G.(Hon. Causa), LL.D.,
Professor (Emeritus) Regius Chair of Midwifery, Glasgow University

IN a low-ceilinged large lumber-room on the top flat of the old Glasgow Maternity Hospital in Rotten Row—cleared of bedsteads and hospital junk and improvised as an operating theatre—I was introduced to the problem of contracted pelvis and witnessed my first Caesarean section. This was in 1889, while I was a senior undergraduate. The patient was a rachitic dwarf with all the characteristic features—pointed chin, prominent frontal eminencies, incredibly short and twisted legs—of these heroic little creatures. She shuffled into the simple operating theatre crowded to capacity by doctors: for word had gone round that Murdoch Cameron was going to perform a Caesarean section. Already he had three successes to his credit—his first having been performed on 10th April, 1888. In those days this was an outstanding achievement, and single successes were noised abroad in the medical world and recorded in the pages of the *Lancet* and the *British Medical Journal*.

Quite probably on the same day another member of the hospital staff dragged out of a small pelvis the bruised and moulded head of a well-developed foetus with forceps or broke it up by craniotomy, if by brute force he failed to extract it; or he might have performed version, the alternative to forceps delivery. In such surroundings I was nurtured in obstetrics, for to the Glasgow Maternity Hospital there were admitted in those days (and even to-day) an enormous number of cases of pelvic deformity of every variety and degree.

Here let me put on record my indebtedness to my two great teachers—the erudite Professor Leishman (father of Sir William Leishman) and his successor, Professor Murdoch Cameron, whose dexterity as an exponent of technique in difficult vaginal deliveries was unsurpassed by any obstetrician I ever encountered in this or any other country. And I must also include Malcolm Black and Robert Jardine, two of my senior colleagues, both of whom were most skilled practical obstetricians.

Looking back and comparing the conditions in the "eighties" of last century with those of to-day, I am truly amazed

*The William Meredith Fletcher Shaw Lecture. Delivered at the Royal College of Obstetricians and Gynaecologists. 22nd May, 1948.

at what has been accomplished. Never in the history of obstetrics—and the same applies to all branches of medicine—has progress been as dramatic as during these 60 years.

In introducing this subject of contracted pelvis I would remind listeners that the problem has changed in recent years. The grosser degrees of malformation, more particularly of the rachitic type, are less frequently encountered to-day. Better feeding and supervision of the infant and young child have brought this about. And I see every prospect that this trend will continue and that rachitic deformities of the grosser type may come to be almost entirely eliminated. There will, however, always remain examples of minor deformities of rachitic and other malnutritional origin; and, needless to state, many due to errors in development of a genetic nature more obscure in origin. This being so the obstetrician of to-day has to be on the look-out not so much for grosser abnormalities easily recognizable, as for minor variations of pelvic formation easily missed. It is true that most of the latter are of no great significance; but of many this cannot be said, and particularly does that apply if the variation is of the android type (Caldwell and Moloy classification, 1939).

Our goal in obstetric practice is to bring down maternal mortality and morbidity, and the stillbirths and neonatal death rates to the irreducible minimum. On the maternal side our goal is almost within sight. This, however, is far from being the case as regards the child—the wastage in infant lives is still far too great. Prematurity apart—which admittedly takes the heaviest toll—there are far too many infants lost by indifferent obstetrical technique in the delivery. And in a considerable number of instances this is primarily due to a failure to recognize beforehand those minor variations in pelvic formation which just tip the balance against a spontaneous birth or an easy delivery with forceps. And here is a further point—not sufficiently appreciated—these variations very often affect the outlet more particularly and are overlooked because the obstetrician concentrates attention on the pelvic brim.

As it is impossible to cover the whole field of contracted pelvis in a single lecture, I have selected dystocia in minor variants for consideration this afternoon. We obstetricians colloquially designate cases in this category as "border-line cases". They constitute a definite and most interesting group, as they demand very special antenatal investigation, and most careful supervision during labour. Furthermore, I am going to deal with the primigravida almost exclusively.

Pelvic formation and capacity, however, is only one factor—although admittedly the most important—which influences labour in contracted pelvis. There are the five others. Size of foetal head. Mouldability of foetal head. "Give" in the maternal pelvis. Degree of rigidity of the cervix. Efficacy of the forces.

The concern of the practising obstetrician is to determine before labour, or failing that early in labour, the extent to which these six factors are likely to affect the labour in the particular patient; for each patient is a specific problem just as truly as every stroke at golf or at snooker is a specific shot.

Pelvic Formation and Capacity.

This factor can be determined with exactness by radiography. I lost the opportunity of making a great name for my medical school and for British obstetrics when I failed to persuade the late J. R. Riddell, one of the leading radiologists in Glasgow, to take up the subject of pelvic radiography in the early years of the century. After

reading the earliest communications on the subject by Budin (1897) and by Albert (1899), I felt certain that pelvic radiography had a tremendous future. Riddell and I did work a little at it, and Riddell contributed a paper to the *British Medical Journal* in 1907 and an appendix to the first edition of my "Operative Midwifery" published in 1908. Unfortunately, however, he never pursued the subject further, although I implored him to do so. Amends were made by British radiologists—Roberts, Rowden, Reece, Nicholson, and others, but that was many years later and by that time our American friends Thoms, Caldwell and Moloy, d'Esopo, Jarcho and a host of others were in the field with full equipment in all their large maternity hospitals. I mention this specific experience in order to impress on you of a new generation the supreme importance of being alert and keeping your minds ever receptive to suggestions. That does not imply that you should be "carried about with every wind of doctrine" as pertains in some countries—you are too British for that!

It is accepted as a first principle in medicine and surgery that diagnosis should be as exact as possible and that every new method of examination, once it has been proved to be sound, useful, and practicable, should be invoked for this purpose. Radiography has been welcomed and is extensively employed by physicians and surgeons as an aid to diagnosis. Yet, today, although it has been proved that a picture of the pelvis can be obtained by radiography more exact than can be constructed by any other means, there are practising obstetricians, familiar with its complications, who are lukewarm to its routine employment for the specific purpose we are discussing, viz., diagnosis of formation and mensuration of the pelvis.

Now why should this be? A radiograph of the pelvis has only to be taken once in a woman's lifetime; the cost need not be great; and only the comparatively few living in some remote locality are put to any inconvenience in having this examination carried out. It is the same old story—opposition to any precautionary procedure which magnifies the seriousness of childbirth, and satisfaction with existing conditions. In the forty-odd years I practised obstetrics I witnessed opposition to a more thorough employment of antiseptics—to greater care in the choice of analgesics and anaesthetics—to the use of rubber gloves—to the wearing of masks—to a more thorough antenatal supervision—to institutional treatment in preference to domiciliary treatment for primigravidae—to restricting practitioners from engaging in obstetrics until they have undergone a special training in obstetrics after graduating in medicine, as recommended by the Royal College of Obstetricians and Gynaecologists (1944). It is also true, however, that I have seen most of these walls of opposition razed to the ground, as will happen in course of time to the last two mentioned as certainly as to-morrow's sun will rise. Whenever I get depressed about any hold-up in progress I recall to mind the fact that it took Lister 20 years to convince the surgeons of London of the efficacy of antiseptics.

I do not think that, with the knowledge now to hand regarding the influence exerted by even minor variations in pelvic formation, we who advocate routine pelvic radiography for all primigravidae have lost our sense of proportion in this matter as many suggest. On the contrary, it is quite within the realm of probability that before many years pass it will be accepted as an essential detail of the antenatal examination. To compromise and say that only if pelvic deformity is recognized by manual or instrumental (callipers) methods

is a radiograph of the pelvis necessary, begs the whole question, for there are most important deviations from the normal only recognizable by radiography. Even those of us who have by practice perfected ourselves in manual methods almost invariably derive additional information from inspecting a good radiograph of the pelvis. At least that was my experience in the last few years I was in practice. That is the position radiography should be given.

In support of this contention that every primigravida should have her pelvis radiographed let me present two imaginary cases. I have presented them before (Kerr, 1939) but they can stand repetition.

CASE 1. *The radiograph shows a typical female pelvis of normal capacity.* Here the presentation in 80 to 90 per cent of cases will be a first or second vertex; but should an occipito-posterior position develop there need be no concern, for in most cases a long rotation will occur. A face or brow presentation is most unlikely, as also is prolapse of the cord. If at the 36th or 37th week a breech presentation is discovered, and even if the legs are extended and external version is unsuccessful, there need be no cause for concern regarding the delivery; in all probability it will not be very difficult. Further, in almost all cases, vaginal examination during labour can be dispensed with—the vaginal examination at the 36th week will have supplied all necessary information. The progress of labour can be determined by an occasional rectal examination.

CASE 2. *The radiograph shows a pelvis of abnormal formation; but not of a gross type obviously necessitating Caesarean section.* Here anything may happen. An occipito-posterior position in a large number of cases and the probability that it will take the short rotation and become *persistent*. Face or brow presentation and prolapse of cord are not improbable, while if the presentation is a breech and cannot be converted there will certainly be difficulty in delivering the after-coming head.

Take everything you can out of radiography! Do not try to determine how far you can dispense with it and how little you need employ it. Physicians and surgeons do not consider such questions; they employ radiography to the fullest extent for purposes of diagnosis. And above all do not concentrate attention on brim formation.

Knowledge of possible difficulties in the delivery, furnished by a radiograph, should not make one unduly anxious or "panicky"; but it should cause one to be particularly watchful of that patient. Further, such a patient should have her confinement in an institution. My contention is that by having a radiograph taken at the 36th or 37th week—or early in pregnancy, as some claim, is an advantage—one is prepared for possible complications arising during parturition; they do not come upon one as surprises.

It has been suggested that the routine employment of pelvic radiography may lead to an increase in the employment of Caesarean section. But that will only take place if the obstetrician is ignorant of the proper employment of radiography and of the interpretation of the radiographic picture.

Chassar Moir (1947), than whom no one has given greater consideration to the problem, as a skilled radiologist and as an experienced obstetric operator, makes this statement: "In my experience radiology has oftener influenced me against Caesarean section than it has in favour of that operation." Thoms is of this opinion also. But Peter Allen (1947b) has had a less fortunate experience with practitioners.*

To my mind the only relevant objection to meticulous antenatal supervision, in-

*There are, unfortunately, a number practising obstetrics who—mostly because of ignorance—fly to Caesarean section on the slightest provocation. They have not studied the problem of "borderline" disproportion; they cannot read a radiograph correctly.

cluding a radiograph of the pelvis, is that it may "rattle" the patient. But patients are not "rattled" by doctors who give attention to details. The doctor who annoys them and loses their confidence—and incidentally helps to keep up the maternal and foetal death-rates—is the man who is casual, pats them on the back, and gaily tells them all will be well after a perfunctory antenatal examination. But let me emphasize the point that employment of radiographic methods for diagnosis implies that the obstetrician can interpret correctly the features of the radiographic picture; and incidentally also that the radiologist has had experience in radiography in its application to pelvimetry. Before I retired from practice I witnessed many faulty conclusions being come to when one or other had inadequate experience in this method of diagnosis. Which all goes to prove that obstetric practice should be in the hands of specialists, general practitioners specially trained in obstetrics and well-trained midwives.

The most useful single pelvic picture is a lateral radiograph. If all the features it reveals are satisfactory, or are sufficient in giving a complete interpretation of the specific pelvic abnormality, there may be no need to take a frontal one. Generally, however, if the lateral radiograph suggests any abnormality a frontal one should be taken to determine pelvic formation at brim, in cavity, and at outlet. You must not concentrate attention on the brim—very many of the less severe degrees of dystocia occur at the plane of "least pelvic resistance" and at outlet.

Here seems the most suitable point for a reference to the investigations and writings of Nicholson (1938, 1943), Ince (1939) and Ince and Young (1940), who favour directing attention not so much to particular diameters as to the plane area. The same idea, but in a simpler form, is Thoms's proposal to take the two principal diameters and add them together.

Nicholson gives the following figures for the pelvic brim:

Brim of	110	sq. cm.	99.9	per cent	of heads	will	pass
,,	100	,,	97	,,	,,	,,	,,
,,	90	,,	70	,,	,,	,,	,,
,,	80	,,	21	,,	,,	,,	,,

But one has to remember that the area, which can be exactly determined by radiography, may not always be a potential area if the pelvic malformation is irregular or asymetrical. I can recall a number of cases illustrative of this point. One was a woman with a scolio-rachitic pelvis who was delivered in my department on three occasions. On the first two with the occiput towards the more roomy side she had a spontaneous delivery. On the third, however, the occiput was towards the narrow side and got held up and I had to perform Caesarean section. In another case in which the pelvis was of the Naegele type—of a marked but not extreme degree—I forecast a spontaneous delivery (with possibly forceps at the outlet), from an examination of the radiograph. What transpired was that the occiput became arrested on the narrow side and I had to perform Caesarean section. Could the occiput have been manipulated into the roomier side I believe a spontaneous delivery might have taken place. This case happened to be one of the last under my care before my retirement. Then there are the variants of the android type of pelvis in which the forepart is narrowed and the cavity and outlet deformities are the problem. Again there is the "high assimilation" pelvis (by no means a great rarity) in which extreme obliquity of the brim is the problem, as Malpas (1936) and Malpas and Hamilton (1939) have pointed out—a condition which very definitely interferes with engagement of the head.

One cannot be as dogmatic as Nicholson is on the exclusive value of area of the particular strait. Thoms (1941), Steel and Javert (1942) all stress this point.

I agree with Peter Allen (1947a) of New Zealand when he states: "interpretations of areas should, therefore, always be done with one eye on the shape of the plane being considered and remembering that the calculation will be more accurate the closer the plane comes to the circular or regularly elliptical."

Allen (1947b) discusses this particular approach and compares his findings with those of Thoms (for brim), Nicholson, Ince and Young, Rohan Williams and Phillips. Exceptional cases are encountered in which Caesarean section was necessary with brim areas of 110 sq. cm.; and on the other hand successful and not unduly difficult vaginal deliveries where the area was 85 sq. cm. or even slightly less. And the same applies for midplane and outlet. But the areas may be slightly smaller for them without extreme dystocia resulting, because the lower pelvis often expands as the foetal head presses upon it.

Now, of course, these investigations are most interesting and valuable, but the practising obstetric specialist is not concerned so much with the percentages of heads which will, or will not, pass through a plane area (brim, cavity, outlet) of this or that dimension, as with what is likely to happen in the specific patient for whose delivery he is responsible.

It would appear, however, that this exact plotting out of areas at brim, cavity and outlet is an aid in many borderline cases to the sorting-out process which I will discuss in a moment or two; and this is the expressed opinion of Chassar Moir (1947). For example, as brim cavity or outlet areas fall below 95 to 100 sq. cm. the frequency of dystocia increases very decidedly and the expectation of a spontaneous delivery or easy extraction with forceps at outlet declines; and becomes highly improbable at 80 sq. cm. and should not be reckoned on unless the child is premature or its head extremely small.

Estimation of Size of Foetal Head and of its Adaptability to Maternal Pelvis.

Here also progress can be recorded. Let me review the stages by which it has taken place.

The simple methods of estimating the size of the foetal head by hands and callipers applied externally came to be replaced by a bimanual vaginal examination with the object of determining the relative size of head and pelvis. It culminated in the famous aphorism by Freeland Barbour—"The foetal head is the best pelvimeter"—which contains more of truth than do most aphorisms. Early in this field was the great French obstetrician, Pinard. His method, like those of Bethel Solomons, and Chassar Moir of recent date, was purely external. Müller's bimanual method was a great advance and I certainly think that my advocacy of utilizing the thumb along the pelvic brim to test the adjustment and overlap of the head was an improvement on Müller's method. He did not advocate the employment of the thumb as I stressed its importance.

For a time it appeared that by this examination at the 36th or 37th week the most suitable treatment for each particular case could be determined. But it was soon found that the changes which took place—the settling down and adjustment of head, softening and relaxation of lower segment and of cervix, and possibly also a slight "give" in the pelvis, between the 37th week and term, had very often put an entirely different complexion on the problem. I found that cases allowed to continue to term furnished many surprises. Most

surprising was the large number in which adjustment of the head to the pelvic brim occurred, although I and my assistants had not expected this was probable. Naturally, there were also cases in which the disproportion turned out to be greater at term than we reckoned at the earlier examination; but the former experience was much more frequent than the latter. And, curiously enough, this, too, is the experience of Williams and Phillips (1946) from their radiographic studies. Here is what they state: "In our series those predictions which have proved erroneous have almost without exception been unduly pessimistic."

I was forced, therefore, to the conclusion that the examination at the 36th to 37th week should constitute only a rough sorting into: (*a*) Cases in which the disproportion was so slight that given satisfactory forces the head would certainly be driven through the pelvis, or at worst would be easily extracted with forceps. (*b*) Cases in which the pelvic deformity was so pronounced that the foetal head could not pass and Caesarean section would have to be employed. In the true "border-line" case I found it impossible to prognosticate with any degree of accuracy whether the head might or might not pass. Thus it came about that I abandoned the operation of induction of premature labour in primigravidae in the early years of this century.

I always look back with particular satisfaction to one period of several months when I had a long series of contracted pelves admitted to my wards and the late David Shannon was my first assistant and Fraser Lee of Edinburgh my house surgeon. We took infinite pains in investigating these cases. By day and night we had consultations over them, and we secured wonderful results. In cases uninterfered with before admission to hospital we had no maternal death in spontaneous or operative deliveries, and only one foetal death, and that was from prolapse of the cord.

Reference to this particular foetal death gives me the opportunity to remind you to be on the lookout for prolapse of the cord. During the last three years of my service in the Royal Maternity Hospital, Glasgow, this complication was recognized by my assistant (the late Alison Hunter) on four occasions in patients who were being given a "trial labour". Caesarean section was performed, and all the children were saved.

This particular approach to "borderline" cases can only be learned by accumulating clinical experience. It calls for patient observation of many, many cases. It cannot possibly be learned by those who freely employ induction of labour in primigravidae. But, as a charming Finnish lady —a patient of mine of long years ago—used to say of the business friends her husband brought to dinner, "For *sem* (them) I care not!"

The problem to-day is: Can this estimating of the relative size of foetal head and maternal pelvis which I have outlined —only necessary if the radiograph shows a pelvic abnormality—be rendered more exact by means of radiographic cephalometry? But before considering that specific question I must make reference to the investigations carried out by Hastings Ince (1939) on "Relation of Body Weight to Biparietal Diameter of Head" and the earlier investigation by Clifford (1934) on "The prediction of the Minimum and Average Body Weight to be expected from a given Occipito-Frontal Diameter." The tables bearing on these respective investigations are given by Browne (1946). They are well worthy of consideration.

It is important to try to estimate the size and weight of the child, for in general they run *pari passu* with size of head. In many

cases one can determine fairly correctly by simple palpation whether a foetus is much below or much above the average, and naturally with greater accuracy if one has a good radiograph of it. But the degree of accuracy attainable is not always sufficient for the purpose. Nevertheless to try to assess size of child is advisable and helpful in making a forecast of the outcome of the labour and in determining the treatment which should be adopted.

To-day we have progressed a stage further, thanks to Reece, Rowden, Roberts, Chassar Moir, and Rohan Williams. You observe I mention only our fellow countrymen. I think we sometimes allow ourselves to be overwhelmed by the mass of contributions furnished by our good colleagues in the United States—great and impressive as they undoubtedly are—and tend to overlook what has been done and is being done at home. Now in this particular field of investigation (estimating relative size of head and pelvis) British obstetricians and radiologists have made contributions of great interest and value.

Did time permit I should very much like to discuss in detail this specific problem of estimating the size of the foetal head *in utero* by radiography. There is a tendency amongst some radiologists (e.g. Allen, 1947a, 1947b; Moloy, 1922; Thoms, 1941, 1946) to question the value of radiographic cephalometry—they seem to me to concentrate too exclusively on the pelvis.

Obviously if one could plot out a chart of of the foetal head with the exactness with which a chart of pelvis at brim, cavity and outlet can be plotted out, then by superimposing the former on the latter the likelihood of adjustment of head to pelvis in the course of labour could be predicted within a small margin of error. Now this is precisely what Chassar Moir, Rohan Williams and a few others are attempting. It is a stage in advance of previous methods, and should be an aid to greater accuracy in making the "labour forecast".

As far as I can judge from their writings, however, it is impossible in many instances to ensure absolute exactness as regards cephalic diameters. For example, Williams and Phillips (1946) state: "Approximate cephalometry is relatively easy in most cases; accurate cephalometry is difficult in many cases." And so they have come to match the foetal heads with stock charts of foetal heads of different sizes (biparietal diameters between 9 and 10 cm.) which can be superimposed upon charts of pelvis at brim, mid-cavity and outlet. And Chassar Moir (1947) is now employing special graphs, as this method is time-saving.

Personally I am convinced that their investigations will prove to be of very great importance and practical value. Rohan Williams informs me that at Queen Charlotte's Hospital the "substantially correct" predictions have risen in the last 300 cases to 92.05 per cent (Arthure and Williams) from 90.11 in the first 300 cases.

I can hear some critics muttering that this investigation is too great a refinement. Don't listen to them! Look upon it as an example of the struggle that has gone on through the ages to attain perfection. Emulate rather the anaesthetists, who seem never to be satisfied with their drugs, equipment and contraptions but are always striving after something better. And I admire their keenness, and that they are not ashamed of showing it. Possibly this is because they have the exuberance of youth on their side; for their speciality is of yesterday; whilst ours had its beginnings in the primaeval forests, jungles and swamps, possibly millions of years ago, and we may have grown weary in the long struggle.

But enough for the factors which are to-day determinable with a very great degree of accuracy. Let us turn to the

others whose influence on a labour is to a large extent guesswork, although not always to the degree generally represented.

Moulding of Foetal Head.

When I was seriously engaged in investigating the progress of labour in contracted pelvis I found I could make a fairly correct allowance for moulding in cases of flat pelvis, and if the head assumed an anterior parietal presentation. But I was unable to do so if the pelvis was generally contracted, or if the presentation was posterior parietal. It was, therefore, with great interest that I read this statement by Chassar Moir (1946):

"Now by revealing pelvic type, radiology will often indicate when moulding will and when it will not be an effective factor."

You see, then, how helpful charts of pelvis and of head may be. But on this specific question (the estimation of the degree of moulding) consideration must be given to size of foetus, size and shape of its head, and the attitude the head develops. It is commonly assumed that 2 to 3 mm. in one diameter is about the degree of moulding one is justified in reckoning on. But much greater moulding than that figure may occur if the head is poorly ossified. And little moulding, if any, will occur if the head is large and round, as then generally it is more than usually ossified—it simply remains perched up above the brim. The disproportion is primarily due to the foetus, and in such cases "trial of labour" is profitless.

A few years ago Moloy (1942) directed attention to the manner of moulding—to the effect pressure in one diameter of the foetal head had on the others.

These observations, as he indicates, must be looked upon as an introduction to what may prove to be an interesting and important subject. The outstanding feature of the contribution is Moloy's contention—formerly questioned and denied by most writers—that the bones at the base of the foetal skull may also take part in the moulding when that becomes extreme.

It is doubtful if we will learn much from experiments with "towel compression" as illustrated in Moloy's paper, as rarely is compression on the head equal at all points. More, we imagine, will be learned from radiographs of the head taken during labour and immediately following delivery, before the bones have had time to readjust themselves to their natural condition prior to labour. A study of moulding may well give information regarding more serious types of moulding which one must be on the lookout for—and warn the operator in certain cases when trial labour should not be permitted to continue longer. And this would be determined by an intrapartum radiograph.

Here I would stress the value of intrapartum radiography if the labour is not progressing to one's satisfaction. You will hear much of this in the coming years. Such investigations are bound to furnish interesting and helpful information.

It may even happen that in carefully selected primigravidae, as experience increases, induction of premature labour may be justifiable; but this is a very different proposition to the promiscuous employment of the operation as pertains to-day.

"Give" in the Pelvis.

More consideration should be given to this factor than it generally receives.

Radiography has confirmed what was claimed from earliest times, that a widening of the pelvic circumference occurs during labour, although not to the degree the ancients believed. This "give" in the pelvis is a result of softening of ileo-sacral

joints and symphysis pubis. Roberts (1934) of Liverpool took up the subject and furnished figures showing a 2 mm. increase at the symphysis pubis and a 2 mm. increase at the sacro-iliac joints. Abramson, Roberts, and Wilson (1934) wrote:

"The symphysis pubis regularly undergoes relaxation with an average increase of width of 3 or 4 mm. but that in about 20 per cent of individuals, for some unknown reason, the relaxation becomes much greater than this—sufficient in fact to be considered a pathological separation."

There has been a good deal of writing on this pathological luxation by James Young (1940) in this country, Heyman and Lundqvist (1932) in Sweden, and others. Both the physiological and pathological luxation are almost certainly hormonal in origin. They vary greatly in individuals, and only if pronounced can be appreciated by manual examination. One can frequently move the two pubic bones by grasping each between forefinger and thumb, or by getting the standing patient to throw her weight first on one leg and then on the other.

But there is a further point. This luxation of the pelvic joints develops as pregnancy advances and reaches its height in the premonitory stage or early in labour. Here arises a question which should be investigated: Is pelvic luxation more pronounced in a labour at term or does it occur to an equal degree if labour is induced at the 36th or 37th week? Because should the former be the case that would be an additional argument against induction of labour in a primigravida. I have no clinical experience to adduce one way or the other on this specific question.

This, however, I can testify to—and incidentally it is stressed by Nicholson (1938, 1943), and by Chassar Moir (1946, 1947)—the lower cavity and outlet often "give" very appreciably during labour. Indeed this explains how it comes about that outlet deformities—measured most carefully with callipers and by radiography—which would appear to promise definite dystocia may not at the actual delivery prove as difficult obstructions as was anticipated. My countryman from the Outer Isles (Dr. A. J. MacLeod, of Lochmaddy, North Uist, 1936) is correct in his contention that he has been able to expand the pelvis with his hand. One might say, literally and metaphorically—he gave the pelvis the "big hand."

However, while there is almost certainly a fractional passive gain in the pelvis, the chief gain or give is brought about by the pressure of the foetal head on the pelvic wall during labour. And it is only in exceptional circumstances, already referred to, that this can be estimated beforehand. All I am contending is that here again, on occasions, the alert clinician may pick up a pointer as to the best procedure to be followed for a particular patient.

Conditions of the Cervix Early in Labour.

This is a detail which does not always receive adequate consideration. With a head held up at the pelvic brim dilatation of the os externum is naturally slower than in a normal labour in which the head sinks early into the pelvis; but the point I wish to make is not that specific phenomenon but rather the inherent character of the cervical ring as regards rigidity and dilatability in the particular patient.

In an ordinary labour the experienced obstetrician can predict generally and fairly early in a labour whether dilatation of the os externum will be slow and protracted, or rapid and easy, from the feel of the ring of the os externum. If, therefore, he finds that the rigidity of the ring promises an unusually slow dilatation it is generally

inadvisable to push "trial labour" very far. Now there is one type of pelvis in which dilatation of the cervix during labour is particularly slow and that is the round pelvis—the pelvis associated with the "dystrophia dystocia syndrome". There are a fair number of women in whom this syndrome exists to a minor degree, although I think Bryan Williams (1942) has probably put the figure too high.

Fortunately the condition of the os externum in labour and its behaviour as regards dilatation can be determined by rectal examination—a vaginal examination is quite unnecessary.

The Strength of the Forces.

Generally speaking the strength of the forces is unpredictable. But in quite a number of cases one can surmise that the forces will prove ineffective. For example, if the pelvis is associated with the "dystrophia dystocia syndrome" the forces will almost certainly let you down. Also in women of hystero-neurotic or the so-called highly strung type the forces very often fail; and of course there are a few who wilt and give out at the first pain. But my experience has been that the vast majority of women stand up to a stiff labour and have efficient forces, especially if supported by the psychological encouragement of nurse and doctor which Dick Read (1943) has stressed as being of so much importance.

And here a word or two on sedatives and analgesics. Good forces can very easily be killed by wrong or wrongly-timed sedatives and analgesics. This is one of the reasons why it is so important to have the primigravida with any pelvic abnormality in an institution where the staff (nurses and doctors) are familiar not only with the actual technique of delivery but with all the little details and subtilities in the management of labour and in the employment of sedatives and analgesics.

Once a patient has lost confidence in being able to effect the delivery herself—either because of the faulty moral support given her by doctor or nurse, or because of injudicious choice of or timing of sedatives and analgesics—she will never regain it in that particular labour. And possibly not even in subsequent labours, as the experiences of the first may give her an inferiority complex *re* her power to effect the delivery by her own efforts.

One final point here. It is not always remembered that these sedatives and drugs given to the patient pass into the foetal circulation. For example, the danger of morphia when given late in labour has been well established. I have little doubt that now and again a child is lost during a trial labour from the drugs and sedatives employed.

From what I have said it is obvious that the "labour forecast" is most likely to prove correct if based upon a careful investigation and assessment (as far as this is possible) of all the factors concerned. The mistake is sometimes made by partisans of one or other particular investigation to concentrate on it, but one cannot afford to leave out of consideration any single factor. And again let me stress the point that skill in prognosticating the outcome of labour in "border-line" pelvic disproportion can only be attained by long apprenticeship at the bedside of patients in labour, supplemented by the radiologist's report and films; and on occasion by having intrapartum radiographs taken and a consultation with the radiologist. This approach to disproportion-dystocia is the only scientific approach; and incidentally it is full of interest to the team responsible for the delivery. Pursued in a teaching school it is of incalculable value in impressing upon students the importance of clinical observation.

Personally, few experiences in my obstet-

ric life have given me greater satisfaction than those in which the "trial of labour" proved justified and Nature triumphed, when the portents before labour were not too promising.

Treatment.

When I was introduced to obstetrics in the late "eighties" Caesarean section—as we know the operation to-day—had been introduced by Kehrer (1882) and Sänger (1882) only a few years earlier, and the controversy on the respective merits of Version and Forceps had ended with the complete rout of the "Versionists"—version had been eliminated as a method of treatment for contracted pelvis.

The succeeding decade of the "nineties", which might be styled "the axis-traction forceps era", is one of the least distinguished epochs in the history of obstetrics; for although it witnessed a progressive employment of Caesarean section it also witnessed a very free use of axis-traction forceps and delivery by force. No obstetric school in this country gave it greater support than did Edinburgh. This lapse, however, may well be forgiven it when one considers the enormous services the Edinburgh school has rendered to obstetrics.

The last important discussion on the employment of forceps in contracted pelvis took place at the Annual Meeting of the British Medical Association in Carlisle in August 1896, and I happened to be present. The discussion was introduced by Milne Murray, who was then recognized as a great authority on forceps. He stated:

"During the last eight years I have delivered living children in several cases where the brim was not more than 3¼ inches, and in one case, already on record, I delivered a living child where accurate measurements of the pelvis made post-partum and under chloroform showed that the conjugate was not more than 2.75 inches. In this case the head was quite free when the forceps were applied, indeed, it had to be steadied by an assistant during their application."

Here were our results in the Glasgow Maternity Hospital at this time. In many cases attempts at delivery with forceps had been made before the patient was admitted to hospital.

Table of 130 cases in which the Conjugate Vera measured 3–3½ inches (7.5–9 cm.) delivered by forceps (1899–1906).

Conjugate Vera	3½ inches	3¼ inches	3 inches
Total cases	39	52	39
Foetal deaths	6	12	18
Per cent	15	23	46

It is easy for you young obstetricians of to-day to express horror at the perpetration of the "high operation" with axis-traction forceps and the patient often placed in the Walcher position and the operator employing all his strength to effect the delivery. But the treatment had to be tried out. Obstetric specialists early realized that it was unscientific and most dangerous and gave it up. The tragedy lies in the fact that others, not specialists, continued to employ the "high operation"; and to-day it is being employed (although admittedly less and less every year) with disastrous results. Truly—"The evil that men do lives after them."

Even the "mid-pelvic operation" should be employed with great discretion and only if the outlet contraction is very slight and if the cause of the arrest of the head is primarily due to ineffective forces, or faulty position and attitude which can be corrected before application of the forceps. In this particular type of case a large caput succedaneum may give the impression that the head is lower than it actually is. Here

again an intrapartum radiograph is of incalculable service.

Induction of Premature Labour.

I have already given my reasons for being opposed to this operation in primigravidae. I consider it far too haphazard a procedure. On the other hand, judiciously employed in plurigravidae it fills a most useful place. The number of unnecessary Inductions of Premature Labour being performed annually on primigravidae in this country may well run into thousands. In no other country does this pertain—are we right and is all the world wrong?

And the operation is by no means free from risks. I have known of several deaths which have followed its employment, of injuries to the cervix and to the lower segment; and the incidence of morbidity following it has been raised again recently by Roblee (1947) and commented upon in an editorial in the *British Medical Journal* (1948). But I cannot possibly pursue this subject further on the present occasion.

To settle this question of Induction of Premature Labour in primigravidae for contracted pelvis once and for all I suggest that our College appoint a committee of inquiry to go into the matter and into the next treatment I am about to refer to, viz. "Trial of Labour". We must have mass figures. Reports by individuals for or against induction of premature labour and trial of labour in primigravidae are not sufficient for the purpose of assessing the relative merits of these two procedures, or if one or both is unsuitable.

Trial Labour.

Stander (1945) has made rather an interesting distinction between (*a*) Trial Labour and (*b*) Test of Labour. The former as he defines it, and as most of us understand it, is to permit the labour to run for a limited period and then to judge from developments whether or not to allow it to proceed. The latter or "Test of Labour" is to give the labour its fullest chance. Here is Stander's statement on the subject:

"Trial labour must not be confused with a true 'test of labour', by which is understood a labour up to the point of full dilatation of the cervix for a period of two hours or longer with the membranes expanded. Of our patients with contracted pelves very few indeed are subjected to a true 'test of labour,' and we are of the opinion that the judicious employment of a 'trial of labour' of some hours usually enables one to foretell accurately whether or not a spontaneous outcome will result."

With this statement I am in agreement, provided the trial of labour gets a fair trial, and that in many instances cannot take place until after the membranes have ruptured and the foetal head has become adjusted to pelvic brim. It not infrequently happens that the labour is hesitant in the first few hours and particularly if the membranes remain intact. None the less the obstetrician of experience can very often surmise its probable course even before the membranes rupture. Prolapse of the cord is almost the only danger to the child at this stage. As already explained, if this should occur Caesarean section is the best procedure.

Now comes the final decision after the labour has proceeded 2–4–6 hours subsequent to rupture of the membranes, when one can nearly always forecast the outcome by determining the position and attitude the head is assuming, the extent to which it is sinking into the pelvis, the quality and duration of the uterine contractions, the fortitude the patient is manifesting, and so on. And naturally, all the time a careful note is kept of the behaviour of the foetal heart; but the observations should not be made too frequently, otherwise the patient may become anxious.

And what can I tell you about results? I can tell you this. No method of treatment gives better results than spontaneous delivery or delivery with a little well-timed assistance from forceps at the outlet supplemented by an episiotomy. But always with this proviso: that the trial of labour is not pushed too far.

In going over the Medical Hospital Reports of a large number of maternity hospitals I extracted these results in one of them:

"Booked Cases" of Spontaneous Delivery in Contracted Pelvis.

	Primiparae at term	Foetal deaths
St. Mary's Hospitals, Manchester, Medical Reports, 1939–1941	75	0

Duration of labour was prolonged: 1 to 96 hours, 1 to 60 hours, 1 to 58 hours, 1 to 49 hours, 2 to 48 hours, and 1 to 44 hours.

Weight of child: 1 was 9½ pounds, 1 was 9 pounds, 13 were 8 pounds or fractionally over that figure.

Now, of course, perfect results such as the above do not often occur; and only in patches, as all of us know. Nevertheless, if large series of cases of "spontaneous delivery" in contracted pelves are investigated it will be found that the foetal mortality is extraordinarily low. And here are two by way of example:

Stander states that for the series (3,370) maternal deaths were 2.1 per thousand. Foetal deaths (gross) 5.1 per cent. (Privately communicated April 15th, 1948.)

The picture, however, assumes a less favourable aspect if trial labour is pushed too far. Peckham and Kuder (1934) as a result of their investigation of 432 cases of "trial labour" in the Obstetrical Service of Johns Hopkins Hospital, Baltimore, state:

"However, if the trial of labour is allowed to progress more than 30 hours the foetal mortality rises to the appalling figure of 19.23 per cent (gross) and the wisdom of allowing a test to become prolonged seems extremely dubious."

The duration of the trial of labour that should be permitted (or is justifiable) depends on the individual and the circumstances of her labour. The obstetric surgeon must retain a balanced judgment and not allow himself to become a partisan for this particular procedure. And he must bear in mind that a prolonged trial of labour ("test of labour" of Stander) is demanding a very great deal from any parturient when Caesarean section (lower segment operation) is attended to-day with such extremely low maternal and foetal death rates.

One last and very important point before I pass on to Caesarean section. If the "trial labour" is not progressing as one

Spontaneous Deliveries in Contracted Pelvis.

	Total cases of contracted pelvis	No. of cases	Maternal deaths	Stillbirths and neonatal deaths
Royal Maternity Hospital, Glasgow, 1930–1933	1,714	597 (34.5 per cent)	1 (0.1 per cent)	24 (4 per cent corrected) 6 intracranial injury, 8 prolapse of cord, 10 not determined
New York Lying-in Hospital, 1932–1947	3,370	1933 (57.4 per cent)	0.2 per cent	5.1 (uncorrected) per cent.

had hoped, much has been gained, for a well-stretched-out lower uterine segment has developed meanwhile, ideal for the "lower segment" operation.

Caesarean section. The present is not the occasion, nor will time permit, to discuss the evolution of the operation during the last 50 years. We have, to-day, two outstanding monographs which deal specifically with this subject, "Caesarean Section: Lower Segment Operation," by C. McIntosh Marshall (1939), and "Caesarean Section, the History and Development of the Operation from Earliest Times," by J. H. Young (1944). Each has rendered a very great service to British obstetrics, and I am delighted to be given the opportunity of stating this publicly.

It was a slow business persuading obstetricians that the lower segment incision is the best approach to the interior of the uterus and that a transverse incision is better than a longitudinal one. The lower segment operation has been so perfected that in uninfected cases a maternal fatality is a great rarity. Even in infected cases, with sulpha-drugs and penicillin the death rate is very low. So low, indeed, that it is questionable if the extra-peritoneal operation is ever necessary or is likely to give better results.

The idea of Physick (1824) to create a port of entrance to the lower segment by separating the unopened lower sac of peritoneum from the bladder and then to pull the former upwards and the latter downwards was a wonderful conception. In practice, however, it is extremely difficult to avoid occasional button-holing of peritoneum and of bladder. Anyone who has been following the recent revival of this operation by Waters (1940) and by Ricci and Marr (1942) in the United States, must have been impressed by the perfection to which they, and a few others, have brought this most difficult operation; and by the low maternal mortality associated with it in their hands. In our country only Lyle Cameron, as far as I know, has employed this type of operation to any extent.

Simpler possibly, but cruder in conception, is the lateral approach associated with the name of Latzko. In recent years Everard Williams tested it out, and with successes in a number of cases. But he informed me the other day that he had given it up. I doubt if we shall hear much more of it in the future.

There is one point I wish to stress regarding the "lower segment" operation—it is the desirability of making the transverse incision as low as possible. In many cases I have actually made the incision across the expanded cervix and have confirmed this by a vaginal examination some days after operation. The scar in this area should be even stronger than one in the "lower segment"; although in my experience the scar in the latter area has proved adequate and almost immune to rupture. This question of the scar and rupture of it in a subsequent labour may not be of great importance if the operation in the first instance is performed for a decidedly contracted pelvis, as a repeat Caesarean section will be necessary. But it is of very great importance in border-line cases, for in them induction of premature labour might be all that is necessary in a subsequent pregnancy. And even more certainly does this apply if the operation is performed for pre-eclampsia or placenta praevia in a young primigravida—must she be condemned to Caesarean section in all her subsequent pregnancies? It does not reflect much credit on obstetric surgery if the answer is yes. I, personally, do not subscribe to the doctrine of "once a Caesarean always a Caesarean" and I trust you young obstetricians to prove by the perfection of your technique that you do not subscribe to it either.

Symphysiotomy. If I have not taxed your patience too far I am going to close this lecture on a very controversial note. I tell you quite seriously that I am convinced there is a place for symphysiotomy in carefully selected cases of outlet deformity. What killed symphysiotomy, when it was revived in the "eighties" and "nineties" of last century, was that it was employed indiscriminately for all types of malformed pelvis from brim to outlet. It was not surprising, therefore, that injuries to bladder and urethra occurred in a considerable number of cases—in two of my early cases this happened (high forceps were used). Those who have had no experience of the operation—and very few indeed have employed it—imagine that impairment of locomotion from injury to the sacro-iliac joints is the danger and a common complication. This theoretical impairment of locomotion is an extremely rare sequela. I never witnessed it in any of my cases—not even in the patient who bolted from hospital with her baby on the 5th or 6th day after operation, and was found by my House Surgeon (who was sent post-haste after her) cooking her husband's dinner. Read the bibliography on symphysiotomy—you will find masses of it in the cellars of the Royal Society of of Medicine in French, German, Italian; and even in English, for Herman, Buist, myself, and a few others employed it—and judge for yourselves.

You will have observed that I stress the importance of employing the operation only in carefully selected cases of outlet deformity and the deformity should be pretty well confined to the transverse diameter. With any marked diminution of the antero-posterior you must go warily. Furthermore, I do not suggest it as a primary choice. It should be a procedure you hold in reserve in case the head is held up at the outlet more than you suspected.

Picture the conditions, 2 cm. of separation at the symphysis pubis (quite a moderate and safe separation) gives 2 cm. of gain in the transverse diameter and converts the arch of the pubis, which is so much talked about by radiologists, from Gothic to Norman. What more could be asked of an obstetrician than to make such an improvement in pelvic architecture! Study the writings of Thoms (1946), Chassar Moir (1946), Morris (1947), and others who have recently discussed the problem of outlet dystocia and you will realize how natural is the operation.

Dramatic is the operation of Caesarean section. But, if you have witnessed an operator making vain attempts to deliver the foetal head (visible at the pelvic outlet by separating the labia) and then seen him divide the symphysis and extract it with ease by means of forceps, you will be forced to admit that the operation of symphysiotomy is just as impressive. And it is so finished, so eminently suitable in the particular circumstances. It is *finesse* in operative obstetrics of the highest quality; and quality is the only thing that really counts.

And now I have come to the end of this commentary on border-line cases of disproportion-dystocia. I trust you young obstetricians will find the individual problems associated with it as interesting as I found them during the 50 years I was engaged in the teaching and the practice of obstetrics.

References.

Abramson, D., Roberts, S. M., and Wilson, P. D. (1934): *Surg., Gynec. Obstet.*, **58**, 595.
Albert (1899): *Berl. klin. Wschr.*, **36**, 535.
Allen, P. (1947a): *Brit. J. Radiol.*, **20**, 45.
Allen, P. (1947b): *Brit. J. Radiol.*, **20**, 205.
Browne, F. J. (1946): *Antenatal and Postnatal Care.* Churchill, London, pp. 595–9.
Budin (1897): *L'Obstétrique*, **2**, 499.

Caldwell, W. E., and Moloy, H. C. (1939): *Amer. J. Roentgenol.*, **41**, 305, 515, 719.
Cameron, M. (1889): *Brit. med. J.*, **1**, 180.
Clifford, S. H. (1934): *Surg., Gynec. Obstet.*, **58**, 727, 959.
Heyman, J., and Lundqvist, A. (1932): *Acta obstet. gynaec. scand.*, **12**, 191.
Ince, J. G. H. (1939): *J. Obstet. Gynaec.*, **46**, 1003.
Ince, J. G. H., and Young, M. (1940): *J. Obstet. Gynaec.*, **47**, 130.
Kehrer, F. A. (1882): *Arch. Gynäk.*, **19**, 177.
Kerr, J. M. M. (1939): *Brit. med. J.*, **1**, 857.
Macleod, A. J. (1936): *Brit. med. J.*, **2**, 282.
Malpas, P. (1936): *Brit. med. J.*, **2**, 1218.
Malpas, P., and Hamilton, C. J. K. (1939): *Proc. R. Soc. Med.*, **32**, 1597.
Marshall, C. M. (1939): *Caesarean section lower Segment operation.* Wright, Bristol.
Moir, J. C. (1946): *J. Obstet. Gynaec.*, **53**, 487.
Moir, J. C. (1947): *J. Obstet. Gynaec.*, **54**, 20.
Moloy, H. C. (1942): *Amer. J. Obstet. Gynec.*, **44**, 762.
Morris, W. I. C. (1947): *Edinb. med. J.*, **54**, 90.
Murray, M. (1896): *Brit. med. J.*, **2**, 1282.
Nicholson, C. (1938): *J. Obstet. Gynaec.*, **45**, 950.
Nicholson, C. (1943): *J. Obstet. Gynaec.*, **50**, 37.
Peckham, C. H., and Kuder, K. (1934): *Amer. J. Obstet. Gynec.*, **27**, 537.
Physick (1824): Quoted by Marshall (1939), p. 7.
Read, G. D. (1943): *Revelation of Child Birth.* Heinemann, London.
Ricci, J. V., and Marr, J. P. (1942): *Principles of Extraperitoneal Caesarean Section.* Blakiston. Philadelphia.
Riddell, J. R. (1907): *Brit. med. J.*, **2**, 636.
Riddell, J. R. (1908): Appendix to Kerr, J. M. M. *Operative Midwifery.*
Roberts, R. E. (1934): *Proc. R. Soc. Med.*, **27**, 1217.
Roblee, M. A. (1947): *Amer. J. Obstet. Gynec.*, **53**, 382.
Royal College of Obstetricians and Gynaecologists (1944): *Report on a National Maternity Service.*
Sänger, M. (1882): *Der Kaiserschnitt bei Uterusfibromen . . .* Leipzig.
Stander, H. J. (1945): *Williams' Obstetrics.* 9th ed. Appleton Century, New York. p. 1080.
Steele, K. B., and Javert, C. T. (1942): *Amer. J. Obstet. Gynec.*, **44**, 783.
Thoms, H. (1941): *Amer. J. Obstet. Gynec.*, **42**, 957.
Thoms, H. (1946): *Surg., Gynec. Obstet.*, **83**, 399.
Waters, E. G. (1940): *Amer. J. Obstet. Gynec.*, **39**, 423.
Williams, B. (1942): *J. Obstet. Gynaec.*, **49**, 412.
Williams, E. R., and Phillips, L. G. (1946): *J. Obstet. Gynaec.*, **53**, 125.
Young, J. (1940): *J. Obstet. Gynaec.*, **47**, 493.
Young, J. H. (1944): *Caesarean Section—History and Development from Earliest Times.* Lewis, London.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY

Queen Charlotte's Maternity Hospital and the Chelsea Hospital for Women have combined with the Postgraduate Medical School of London to form an Institute of Obstetrics and Gynaecology. Courses of instruction and training for advanced students will commence on 1st October, 1948. Requests for information and applications for enrolment, stating qualifications and previous experience, should be directed to the Secretary of the Institute, Postgraduate Medical School, Du Cane Road, London, W.12.

PREGNANCY ASSOCIATED WITH A SEPTATE UTERUS, DOUBLE VAGINA AND OTHER CONGENITAL ABNORMALITIES

BY

JEAN R. C. BURTON-BROWN, M.D., M.R.C.O.G.,
Nuffield Department of Obstetrics and Gynaecology, University of Oxford

INTRODUCTION.

IN the past few years a considerable number of cases of congenital abnormalities of the genital tract have been reported, and it is reasonable to suppose that minor degrees of maldevelopment are much commoner than is generally believed. It is also probable that certain abnormal occurrences in pregnancy and labour have their origin in unsuspected defects of the genital organs (Way, 1945).

Defects of the genital tract are not always obvious, and many women pass through their confinement without the midwife or doctor becoming aware of their presence. Even when the defect involves the external organs (for example, a vulvar opening of the anus) the condition may be overlooked, and many women reach adult life without suspecting that there is anything unusual in their anatomy.

TYPES OF ABNORMALITY.

Genital tract defects vary from the faintest depression of the fundus of the uterus to complete absence of the genital organs. These defects may be described under three headings:

(1) Failure of fusion of the Müllerian ducts. Examples of this include uterus didelphys, uterus bicorpus bicollis, uterus bicorpus unicollis, uterus arcuatus. These are mentioned in order of decreasing severity of defect.

(2) Failure of development of the Müllerian ducts. This results in absence of the uterus with or without absence of the vagina, in the so-called rudimentary horn of the bicorpus bicollis uterus, or the uterus unicorpus.

(3) Persistence of the medial septum. According to whether this septum is complete or incomplete, it gives rise to a septate uterus and vagina, or to a subseptate uterus or septate vagina.

Anal defects arise from incomplete differentiation of the cloaca into the sinus urogenitalis and the rectum. The anus may be absent—the rectum will then be completely sealed off from the perineum—or the rectum may open into the posterior wall of the vagina, the bladder, or posterior part of the vulva, namely, the vulvovaginal anus. Not infrequently there is absence or deficiency of a sphincter around the ectopic anus.

Renal defects arise from agenesis of one, or part of one, urogenital fold. This results in absence of the kidney, the ovary, the Fallopian tube and half the uterus on that side. Fusion between two kidneys, forming the horse-shoe kidney, may be associated with a persistent uterine septum as in the case to be recorded.

The special object of this article is to draw attention to the fact that, when one abnormality exists, it is highly probable that others will be found, not only in the

urinary tract, which is so closely associated with the genital system in its development, but, at times, in other parts of the body.

Wharton (1925) states, "In practical application it means that a study of a patient with a malformation of either reproductive or urinary organs is fundamentally incomplete unless the investigation includes the whole genito-urinary system. . . . In their earlier development the Fallopian tubes, uterus and vagina are directly associated with the formation of the pelvis, the abdominal wall, the rectum, sigmoid, bladder and urethra. This conclusion, founded on embryological research, has been verified clinically by the frequency with which abnormalities of the uterus are associated with abdominal hernia, ectopic ovary, unusual proportions of the bony pelvis, exstrophy of the bladder, abnormalities of the rectum, sigmoid and anus, atresia ani, vulvo-vaginal anus and congenital fistulae due to incomplete development of the hollow viscus."

Incidence of Abnormalities.

Eismayer (1923) collected records of 122 cases of absence of one kidney associated with malformation of the uterus. Ballowitz (1895) studied 71 cases of similar renal abnormality and in 41 instances found malformation of the reproductive organs.

Regarding the frequency of uterine anomalies, Smith (1931) recorded that whereas only 16 cases were discovered in the general hospital records over a period of 26 years (1 in 7,040), no less than 19 cases (1 in 1,458) were observed by himself in careful examinations made over a period of 5½ years, showing in all probability that many cases passed unnoticed in the previous group. Pfleiderer (1929) recorded that, over a period of 20 years, 16 out of 91 cases of genital abnormality were of the uterus septus variety with double or single vagina. Masson and Kaump (1937) recorded 17 cases discovered at necropsy among which were 4 examples of septate uterus and vagina. Taylor (1943) found that either complete or incomplete lack of fusion of the Müllerian ducts arises in about 1 in 1,500 cases reported from obstetrical wards and 1 in 2,000 from gynaecological wards.

Finally, in this country, Way (1945), reporting on 18,000 obstetrical admissions and 10,000 gynaecological admissions in Newcastle during 1938 to 1945, found 23 cases of uterine abnormality, one of which was of the uterus septus type.

The Effects of Abnormalities of the Genito-urinary System.

(*a*) *In the pregnant woman.* It is recorded by Way that in 32 pregnancies (a series of 12 patients with uterine anomalies) the following complications occurred: transverse lie 12; abortion 12; breech delivery 4; premature labour 3; retention of whole or part of the placenta 3; prolapse of the umbilical cord 2; placenta praevia 2. Falls (1939) reports that the incidence of postpartum haemorrhage is higher in cases of uterus arcuatus than in those of normal uterine development. As well as these complications bleeding may occur from the non-pregnant portion of a double uterus during pregnancy, and is sometimes followed by the passing of the decidual cast. Uterine rupture, unfortunately, must be added to the list; it may occur in a rudimentary horn, or where there is undue thinning of the poorly developed myometrium, or because of obstructed labour associated with malpresentation. According to Berkeley, Bonney and MacLeod (1938), twin pregnancy is slightly more than 7 times as common in the double uterus as it is in association with the normal uterus.

In the case of an abnormal kidney, pregnancy may light up an incipient pyelo-

nephritis (Everett, 1947) or glomerulonephritis. These dangers are surely of even greater import than many mechanical difficulties related to the uterus, which can be dealt with by careful observation and timely intervention.

It is possible that pre-eclampsia may also occur more frequently because of deficiency of renal function. Finally, the solitary ectopic kidney may be severely injured by the passage of the foetal head during labour, resulting in uraemia and the death of the mother.

(*b*) *In the non-pregnant state.* Dyspareunia sometimes occurs where a vaginal septum exists, or in the case of absent vagina when coitus may take place through an abnormally patulous urethra. Other symptoms include amenorrhoea, dysmenorrhoea, menorrhagia or other menstrual irregularity. Bainbridge (1924) states that in the uterus duplex menstruation may take place first from one organ and then from the other, the total loss being equivalent to the menstruum occurring at monthly intervals.

Case History.

On 2nd January, 1948, an unmarried woman, aged 31 years, was referred by her doctor who wished to have a second opinion regarding treatment. He found that she was 16 weeks pregnant and, in view of the fact that she had bilateral congenital dislocation of the hips with gross pelvic contraction, he was anxious to know whether a termination of pregnancy should be considered.

The menarche occurred at 13 years; menstruation lasted 7 to 8 days, appearing every 28 days. It was regular but exceedingly heavy, necessitating the use of 60 pads each menstrual period.

Giving details of past history, the patient stated that, a few days after her birth, an operation was performed upon her because "there had been no bowel action." At the age of 11 she underwent an operation for the congenital dislocation of the hips (bilateral-angled osteotomy). This enabled her to walk more easily. No history of congenital abnormalities in any other member of the family could be given.

On Examination.

The patient was a small woman, under 4 feet 8 inches, and walked with a typical waddling gait. In spite of 18 years of menorrhagia no sign of anaemia could be detected. There was evidence of some mental retardation. Albumin was present in the urine. The blood-pressure was 120/80.

On palpating the abdomen there was a cystic swelling in the mid-line equal in size to a 16 weeks' cyesis. On inspecting the vulva, a septum was visible at the introitus and on exploring with the finger it was found to divide the vagina into two lateral components. A softened cervix could be felt in each vaginal vault.

Arising from, and moving with, the right cervix was a cystic swelling. On the other side, connecting with the left cervix, was another smaller but firm irregular mass in a position postero-lateral to the cystic swelling. A diagnosis of double uterus was made, with a pregnancy in the right uterus and several small fibroids in the left uterus.

One further finding was of interest, namely, the absence of an anus. The rectum was found to open into the posterior part of the vulva. There was an excellent sphincteric muscle and the patient had perfect control of her motions. (Figure 1 shows the vaginal septum, the vulvo-vaginal anus and anal dimple, and Figure 2 shows a rubber tube in the vulvo-vaginal anus and the vaginal septum more fully exposed.)

In view of the albuminuria and the possible association of congenital anomalies of the genito-urinary tract, it was decided to carry out an intravenous pyleography and, if possible, by means of hystero-salpingography to assess the type of double uterus.

Investigations.

X-Ray reports were as follows: (1) A foetus of 4 months' maturity with a vertex presentation, (2) bilateral congenital dislocation of the hips (Fig. 3), (3) congenital deformity of both kidneys amounting to a horse-shoe kidney, the ureter absent on the right side.

Catheter specimen of urine: 100 mg.

FIG. 1.
The vaginal septum, the vulvo-vaginal anus and anal dimple.

FIG. 2.
The rubber tube in the vulvo-vaginal anus, and vaginal septum more fully exposed.

FIG. 3.
Bilateral congenital dislocation of the hips and contraction of the pelvic inlet.

FIG. 4.
The uterus septus showing placental site.

protein. Blood urea: 38 mg. per 100 ml. Haemoglobin 109 per cent. Blood group: A, Rh negative.

It was decided to terminate pregnancy because of albuminuria appearing at an early stage of pregnancy and the probable impairment of renal function.

On discussing with the patient the additional complication of fibroids and the desirability of a further operation if it proved impractical to remove them at the time of hysterotomy, she expressed a desire to have the uterus removed and thereby be free of her distressing menorrhagia. She declared that she never wished to marry and have children. Indeed, hysterectomy appeared to be the most logical form of treatment.

On 14th January, 1948, at operation, the uterus, rather surprisingly, appeared to consist of one swelling, but it was soon found that a firmer portion on the left corresponded to the non-pregnant uterus and from this the right uterus was enlarged to form the cystic swelling. Small fibromyomata were dotted about the non-pregnant uterus, one or two being present in the other uterus. A hysterotomy was performed to confirm the presence of a septum, followed by a total hysterectomy. Both ovaries and Fallopian tubes appeared normal and were left *in situ*.

On exploration of the peritoneal cavity, the larger functioning portion of the kidney was found to be situated on the left side of the 3rd, 4th and 5th lumbar vertebrae. The smaller portion, representing one-third of the whole, was present at the level of the 4th and 5th lumbar vertebrae on the right side. There was no transposition of gut nor could a Meckel's diverticulum be detected.

No obvious congenital abnormalities were found in the foetus.

In Figure 4 the double uterus is shown: there are 2 uterine cavities and cervical canals and the placental site is in the right uterus. The fibroids are not seen in this view of the specimen.

The patient made an uninterrupted recovery.

Discussion.

Here is a case of a woman with a septate uterus and vagina entering the 5th month of pregnancy without unusual symptoms. The presentation was a vertex and it seems likely, owing to the uterine septum, that the baby would have remained in this position. The placenta was situated on the fundus of the right uterus and not on the septum, so that risk of abortion was minimized. The signs which aroused suspicion of pelvic deformity were the small stature and characteristic limp.

The renal abnormality with impaired function was the point on which the whole treatment of the case rested, for congenital abnormalities of the kidney predispose to nephritis, formation of calculi and pyelonephritis and, according to Gutierrez (1933), this is particularly so in the condition of solitary kidney.

It is interesting to note that in this case, although only a small septum divided the uterus to produce 2 similar organs, yet the hypertrophy of the uterus containing the foetus and placenta quite overshadowed the hypertrophy brought about by hormonal influences in the other, where, although there was a well-formed decidua, the thickness of the wall was approximately half that of the pregnant organ.

The possibility that various developmental defects may co-exist is shown in this case by the abnormalities found in the pelvic girdle, rectum, kidney, ureter and uterus.

Summary.

(1) A short survey of the incidence of abnormalities of the genital and renal tracts is given.

(2) The possibility that these abnormalities may be combined is emphasized.

(3) A case is recorded in which the following abnormalities occurred in combination: (*a*) uterus septus and duplex vagina, (*b*) horse-shoe kidney with one ureter, (*c*) vulvo-vaginal anus, (*d*) bilateral congenital dislocation of the hips.

(4) In cases of malformation of the genital tract the importance of searching for anatomical abnormalities in the renal tract, and of assessing renal function, is stressed.

I wish to thank Dr. G. A. C. Summers for his kind help in providing the photographs.

REFERENCES.

Bainbridge, W. S. (1924): *Amer. J. Obstet. Gynec.*, **7**, 285.

Ballowitz, E. (1895): *Arch. path. Anat.*, **141**, 309. (Quoted by Wharton (1925).)

Berkeley, C., Bonney, V., and MacLeod, D. (1938): *The abnormal in obstetrics and gynaecology*. Arnold, London, p. 200.

Eismayer, G. (1923): *Z. urol. Chir.*, **11**, 191. (Quoted by Jarcho (1946).)

Everett, H. S. (1947): *Amer. J. Obstet. Gynec.*, **53**, 47.

Falls, F. H. (1939): *Amer. J. Obstet. Gynec.*, **38**, 661.

Guiterrez, R. (1933): *Arch. Surg.*, **27**, 686.

Jarcho, J. (1946): *Amer. J. Surg.*, **71**, 106.

Masson, J. C., and Kaump, D. H. (1937): *Amer. J. Obstet. Gynec.*, **33**, 566.

Pfleiderer, A. (1929): *Mschr. Geburtsh. Gynäk.*, **82**, 401. (Quoted by Jarcho (1946).)

Smith, F. R. (1931): *Amer. J. Obstet. Gynec.*, **22**, 714.

Taylor, H. C. (1943): *Amer. J. Obstet. Gynec.*, **46**, 388.

Way, S. (1945): *J. Obstet. Gynaec.*, **52**, 325.

Wharton, L. R. (1925): *Surg. Gynec. Obstet.*, **40**, 31.

A FURTHER CASE OF STROMAL ENDOMETRIOSIS

BY

W. WALLACE PARK, M.B., Ch.B.

Assistant Histologist, Royal College of Physicians' Laboratory, Edinburgh

AND

R. A. TENNENT, *M.B.E.*, M.B., Ch.B., M.R.C.O.G.

Gynaecologist, Hairmyres Hospital, Lanarkshire, Scotland

THERE have by now been described under a variety of names at least 35 examples of a diffuse type of new growth of the uterus in which the abnormally situated tissue bears a morphological resemblance to endometrial stroma.

Casler (1920) describes 1 case, with no aetiological designation but the descriptive title, "a unique, diffuse, uterine tumour".

Dougal (1926) describes 1 case as an "unusual, diffuse, uterine tumour", to be regarded as either a sarcoma or a benign tumour of the endometrial stroma.

Frank (1932) describes 3 cases under the title, "fibromyosis. An unclassified, plexiform, endolymphatic proliferation of the uterus". The resemblance of cell-type to that of endometrial stroma was noted with, in 1 of the cases, the microscopical diagnosis "adenomyoma without glands". Ewing (1940) quotes these cases and classifies them as "diffuse intravascular myomatosis", and comments that the growth was intramural and intralymphatic as well as intravascular.

Goodall (1943) describes 14 cases, 12 of them as "chronic parietal stromatous endometriosis", the other 2 as "acute, parietal, stromatous endometriosis with restricted malignant characters". This author considers that the proliferating tissue is derived from the endometrial stroma either by direct extension, or by lymphatic embolism, or by expansion from stromal cells pre-existing as a diffuse network throughout the whole of the myometrium.

Robertson, Hunter, Larson and Snyder (1942) describe 6 cases as "benign and malignant stromal endometriosis", also supporting the theory of development by direct extension from endometrial stroma.

Miller and Tennant (1944) describe 3 cases, "endometriosis interstitiale", with similar views on aetiology.

Henderson (1946) describes 7 cases under the title, "endolymphatic stromal myosis". This author agrees with Goodall that the tumours have their origin in endometrial stroma but concludes on grounds of clinical behaviour that the condition is an entity distinct from endometriosis. In a discussion on these 7 cases Novak stated that he was inclined to interpret them as representing low-grade sarcomas of endometrial origin.

One further case is here described:

CASE RECORD

A married woman aged 39 years, was admitted to Hairmyres Hospital, on 26th April, 1947. Her complaint was of pain in the right side of the abdomen for 1 year. The pain was described as a constant, dull ache, but on two separate occasions it had become more severe for short periods. The

pain was always located in the right iliac fossa and had never been accompanied by nausea or vomiting. Her general health had been good and she had not noticed any loss of weight.

Since the menarche at 14 years, the menstrual cycle had been 6 to 7 days every 25 to 28 days. The last period began on 12th April, 1947. There had been no intermenstrual bleeding. During the last year on several occasions the menstrual loss had been excessive. There had been no dysmenorrhoea.

She had borne 2 normal full-time children in 1931 and 1936. There had been no complications of pregnancy, delivery, or the puerperium.

Thyroidectomy had been performed 13 years previously. The patient was originally admitted to the surgical wards as a suspected case of chronic appendicitis, but on discovery of a mid-line, subumbilical swelling, she was transferred to the gynaecological ward.

The patient was a rather thin woman of medium build. On abdominal palpation there was a large firm symmetrical swelling in the mid-line extending from the pubes to just below the umbilicus. It was mobile from side to side. There was tenderness on deep palpation of the right iliac fossa. On vaginal examination the uterus was enlarged symmetrically to the size of a 4 months' pregnancy and was of a firm consistency. The cervix was firm and multiparous in character. There was some thickening and tenderness in the right fornix.

A diagnosis of a large intramural fibroid was made and operation decided upon.

On 30th April, 1947, the abdomen was opened by a right paramedian sub-umbilical incision. The uterus was symmetrically enlarged to the size of a 4 months' pregnancy. No individual fibromyomata could be seen or felt. The right ovary was slightly enlarged and several small follicular cysts were present. The left ovary and tube were normal. In the right broad ligament there were 2 tortuous, finger-like processes extending from the lateral margin of the uterus out towards the pelvic wall. The upper process was just below the ovarian vessels and did not quite reach the pelvic wall. The lower process was in the region of the uterine vessels and extended far out on to the pelvic wall. The left broad ligament was normal. During hysterectomy the upper process was removed completely along with the right Fallopian tube and ovary. An attempt was made to dissect out the lower process. Complete removal was impossible and it was therefore clamped and cut across. The uterine vessels could not be identified separately from the process and several greyish " worm-like " ends exuded from the cut surface. As surgery was incomplete in any event, supravaginal hysterectomy was performed, the left Fallopian tube and ovary being conserved. The appendix was retrocaecal and contained several faecoliths and, in view of the history of pain in the right iliac fossa, was removed. The abdomen was closed.

Convalescence was uneventful and the patient was discharged on 27th May, 1947.

A course of deep X-ray therapy was given at Glasgow Royal Infirmary, commencing 9th July, 1947, the details of which are as follows:

Two fields—anterior and posterior; 15 cm. Circle. Incident dose, 3,000 r units to skin. Total dose to skin, 3,510 r units. Minimal tumour dose, 2,760 r units, given over 3 weeks, 15 applications. Quantity of radiation: 200 K.U. 1 mm. Copper half-valve layer.

The woman was seen again on 14th January, 1948. Apart from some climacteric symptoms, she was in good health. On examination the cervical stump was healthy and there was no evidence of recurrence in the pelvis or abdomen.

Macroscopical Description of Organs.

There were two specimens—one a supra-cervical uterus, the other an ovary with the outer 3 inches (7.5 cm.) of Fallopian tube attached.

The uterus had already been cut open but reconstitution showed that it was symmetrically enlarged and approximately the size of a 4 months' pregnant uterus. The peritoneal surface was smooth and free from adhesions. The already cut myometrial surface was not smooth. It was studded with a mass of small, dome-shaped protuberances 2 to 5 mm. in diameter consisting of smooth, firm, white tissue. These protruded through an irregular fibrous trabeculum and gave a comedo-like effect.

There was a conical mass lying in one broad ligament, 3 cm. deep opposite the cornu, tapering to end close to the cervical stump.

The ovary was oval in outline and enlarged, measuring 5 by 2.5 by 2 cm. Its outer surface was smooth but had a polycystic contour. The attached

FIG. 1.

Section through the endometrial cavity. × 1½.
(*a*) Polyp. (*b*) Tumour tissue.

FIG. 2.

General appearance of most of the abnormal tissue—cellular, uniform, undifferentiated.
× 100

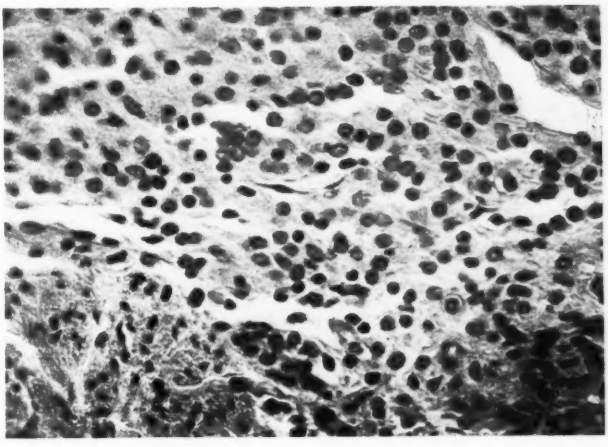


FIG. 2*a*.

Higher magnification of the same area. × 400.

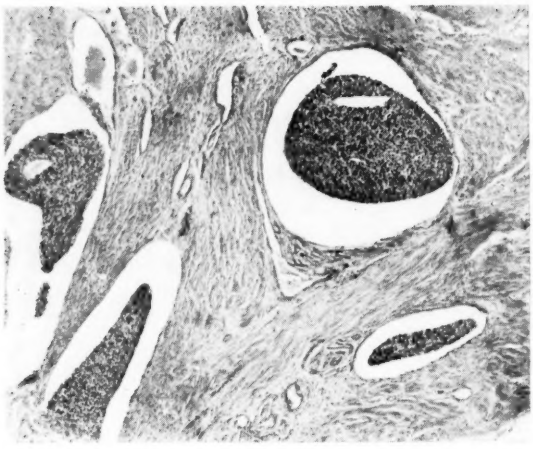


FIG. 3.

Tumour deposits in retracted tissue spaces giving the impression of lymphatic embolism. ×60.

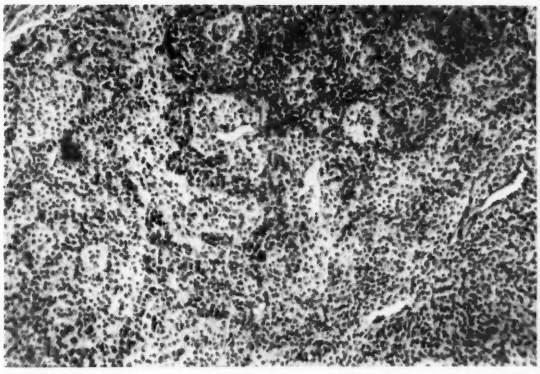


FIG. 4.

The faint beginnings of an arborescent pattern. ×100.

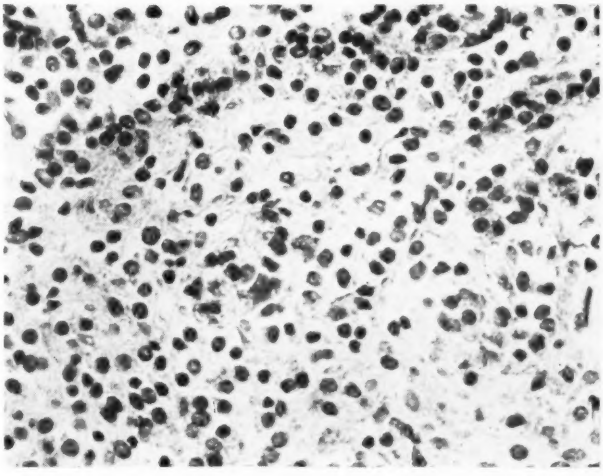


FIG. 4*a*.

Higher magnification of the same area showing cords of darker staining cells running across the upper part of the field. ×400.

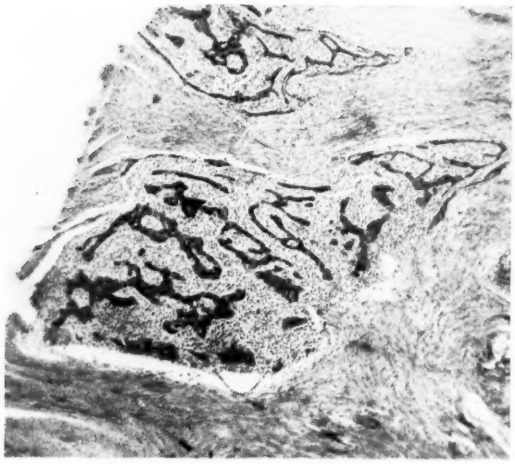


FIG. 5.
Well-marked arborescent pattern. ×60.

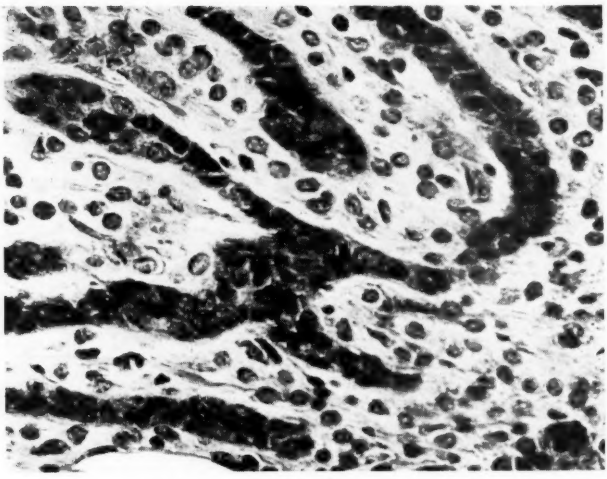


FIG. 5*a*.
Higher magnification of the same area. ×500.

FIG. 6.
Canalization of several of the branches suggesting epitheliogenesis. ×100.

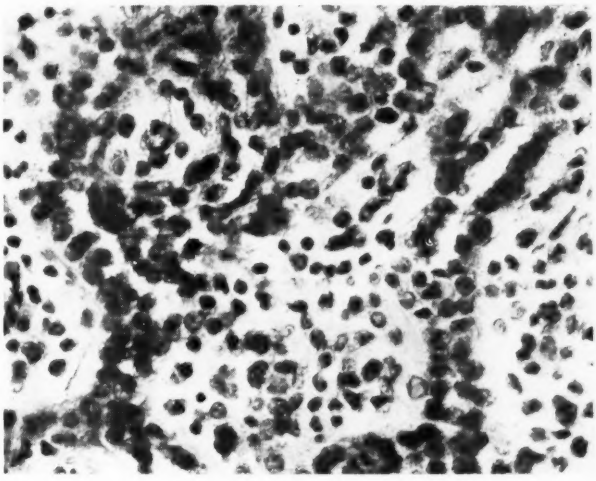


FIG. *6a*.
Higher magnification of the same area. ×500.

length of Fallopian tube appeared normal. There was one narrow cord of firm, elastic tissue lying in the mesosalpinx parallel with the Fallopian tube.

Additional facts found on further gross section were:

1. *Bulk of uterus.* The uterus was extensively permeated with deposits of an abnormal tissue.

The enlargement was seen to be only outwardly symmetrical. It was due to a greatly expanded posterior wall and fundus which curved forward over the cavity like a cowl. The anterior wall was represented by a small quadrantal block of tissue which contained one cord of the permeating tissue but was normal otherwise.

The recut surface appeared as an irregular mosaic of large and small islets of homogeneous white tissue partly fusing with each other but mostly separated by thick or thin trabeculae. Deep within the posterior wall was one cystic cavity the size of a walnut. It had a smooth lining; was largely occupied by a pedunculated mass of the firm white tissue; and had a content of clear, pale yellow fluid. Some of the larger islets were solid cords of tissue in cross-section in that they lay within smooth-lined tubes and showed clean separation from the walls on traction but most of them were closely blended with the interstitial strands.

Over much of the fundus the abnormal tissue was visible through the peritoneum. There were no recognisable fibroids anywhere in the specimen.

2. *Uterine cavity.* This was a slit-like space situated low down anteriorly, 6 cm. long by 3 cm. wide at its broadest part, with postero-superior and antero-inferior walls in close apposition.

On the posterior wall of the cavity was one small polyp flattened between the opposing surfaces. It appeared to extrude from the deeper tissue through a fenestration in the endometrium rather than arise from the endometrium itself. Elsewhere the endometrium had a normal naked-eye appearance. Its greatest depth at any point was 5 mm. (Fig. 1).

3. *Broad ligament mass.* The cut surface at first suggested a group of large lymph nodes, but further sections showed that the "nodes" were thick cords of the infiltrating tissue cut across.

4. *Fallopian tube.* This was 1 cm. in diameter, with a thick epithelium and of normal appearance. The cord of tissue in the mesosalpinx was 3 mm. across, firm, translucent, and tapering to end near the fimbriae.

5. *Ovary.* Bisection showed one cystic space 2 cm. in diameter with thin, smooth walls and a clear fluid content; and three smaller cysts filled with gelatinous substance. The stroma was firm and uniform and did not contain any visible tumour tissue.

Microscopical Appearances.

Endometrium. Apart from a very occasional small focus of lymphocytes, the endometrium had a normal post-proliferative appearance. There was no adenomyosis. The polyp already mentioned showed marginal blending with the true endometrial stroma around its neck, and it had a covering of columnar epithelium. It did appear, however, to be formed by the extrusion of a cord of abnormal tissue growing upwards from the depths of the uterus.

Ovary. Simple follicular cysts were present; there was a normal cellular stroma and no evidence of new growth.

Abnormal tissue. Apart from an arborescent arrangement in some places (mentioned later) the cytological pattern was a flat field of entirely uniform, faintly eosinophilic cells. Owing to fusion the margins of the cells were not distinct but the nuclei were prominent. They were oval, measuring on an average 8μ by 12μ, and round in cross-section, with a finely granular chromatin content and clear nuclear membrane. Nucleoli were very few and not well formed, mitoses scanty and of normal type. The absence of polymorphism anywhere was striking. The growth appeared to be of completely undifferentiated stem-cell type (Figs. 2, 2a).

The tissue was only moderately vascular. It contained relatively few capillaries and only occasional thick-walled vessels of the type illustrated by Goodall (1940) and by Henderson (1946).

In some areas the tumour tissue lay within spaces with an endothelial lining (Fig. 3). No valves were seen in any of these spaces and we do not feel justified in calling them lymphatics. The appearance could be due to artefact retraction of ordinary tissue spaces which have been expanded by pressure of the permeating new growth; and they confirm the macroscopic appearances of cords of tissue lying in smooth-lined tubes.

In a number of places within the deposits of abnormal tissue there was a distinctive arborescent pattern (Figs. 4, 4a, 5, 5a). The cells which make up the branches stand out from the surrounding tissue by reason of a more pyknotic nucleus and a more basophilic cytoplasm. The pattern in general has an " epithelial " appearance (even if, in this instance, mesodermal epithelium), and in several areas there are branches which show canalization (Figs. 6, 6a). We consider that these features can justifiably be interpreted as attempted gland formation.

These branching cords bear a strong morphological resemblance to the primitive sex cords which arise in the developing gonad and which eventually form the rete ovarii. The Müllerian duct has its origin very close to the developing gonad and there may be aetiological significance in the appearance of this pattern in abnormal tissue in an organ so intimately related embryologically to the Müllerian duct.

Comment.

Clinically the case resembles those previously described. The findings at operation were almost identical with those of the first case described by Goodall (1940). The finger-like processes in the broad ligament bore a strong resemblance to those shown in the photograph of the specimen in the first case described by Henderson (1946). The memory of this photograph enabled the operator to make a tentative diagnosis of the condition before the pathological findings were available.

These findings are very similar to those of cases reported by previous writers. An interesting addition is the canalization of some of the branches which make up the arborescent pattern. A similar pattern was noted by Dougal (1926) and by Goodall in one of his cases (1940, case 3, p. 20) but neither author reported canalization. If it is accepted that this finding can reasonably be interpreted as early epithelial gland formation, it establishes a closer identity of the abnormal tissue with endometrium than has been possible so far, since in none of the previous cases has there been evidence of any epitheliogenesis in the permeating stromatous tissue. Identification of the constituent cells with endometrial stroma has so far had to be based on morphological appearances alone.

Yet this glanduliform differentiation does not constitute proof that the tumour tissue is derived directly from endometrium by invasion or embolism. There remains at least the possibility that the tumour tissue and endometrium have a common ancestor and that the process is a neoplasm proper having its origin in partly differentiating tissue of embryonic bipotency lying indiscriminately throughout the uterus, tissue which in the course of normal development becomes restricted in situation to the inner surface of the uterus, and in function to the formation of endometrial glands and stroma.

Summary.

1. A further example of "stromal endometriosis" is reported.

2. Clinical and pathological features agree closely with those of cases reported by previous authors, with the addition of suggestive evidence of epitheliogenesis in the abnormal tissue.

We should like to take the opportunity of expressing our thanks to Dr. Johnstone, *O.B.E.*, Superintendent, Hairmyres Hospital, for permission to publish the case; to Dr. Morrison of the Radio Therapy Department of the Glasgow Royal Infirmary, for the details of the deep X-ray therapy; to Lt.-Col. W. F. Harvey and Dr. James C. Lees for helpful comments during the preparation of this paper; and to Mr. Stanley Hay, Technical Supervisor at the Royal College of Physicians' Laboratory, for preparing the photographs.

REFERENCES.

Casler, D. B. (1920): *Surg. Gynec. Obstet.*, **31**, 150.

Dougal, D. (1926): *Trans. N. Engl. Obstet. Gynaec. Soc.*

Ewing, J. (1940): *Neoplastic diseases*, 4th ed., Saunders, Philadelphia.

Frank, R. T. (1932): *Amer. J. Cancer.*, **16**, 1326.

Goodall, J. R. (1940): *J. Obstet. Gynaec.*, **47**, 13.

Goodall, J. R. (1943): *A Study of Endometriosis*. 2nd ed. Lippincott, Philadelphia.

Henderson, D. N. (1946): *Amer. J. Obstet. Gynec.*, **52**, 1000.

Miller, J. R., and Tennant, R. (1944): *Amer. J. Obstet. Gynec.*, **47**, 784.

Robertson, T. D., Hunter, W. C., Larson, C. P., and Snyder, G. A. C. (1942): *Amer. J. clin. Path.*, **12**, 1.

ANGINA OF EFFORT IN PREGNANCY
(Report of a Case)

BY

A. SCHOTT, M.D., M.R.C.S.

Medical Officer in Charge of the Cardiographic Department, Queen Mary's Hospital for the East End, Stratford, E.15.

ANGINA of effort during pregnancy is so rare that a report of a case in which this diagnosis could be made with reasonable certainty seems justified.

A woman, aged 37 years, was first referred to the writer on 1st November, 1945, because of precordial pain. She was then in the 3rd month of her 2nd pregnancy. An opinion was requested about the nature of the pain and the cardiac condition with special reference to a cardiac indication for terminating the pregnancy.

History. The patient's father died of a stroke at the age of 50; he was stated by the patient to have been very excitable and under treatment by "nerve specialists".

The patient had scarlet fever, diphtheria and otitis media at the age of 1½ years, measles and whooping cough later in childhood, severe tonsillitis with removal of one tonsil at the age of 24 and attacks of nausea and giddiness, diagnosed as vascular in origin, at the ages of 31 and 32. She had 1 healthy child, aged 8 years, with a normal pregnancy, terminated by Caesarean section for obstetrical reasons.

She had always been highly strung. When a child she was given to prolonged crying fits which were associated with a burning sensation in the chest. All her life she was prone to palpitation and partial deafness on emotional upsets. There was no history of loss of weight or undue perspiration.

Pain across both sides of the chest occurred for the first time at the age of 34 when carrying a heavy parcel; it lasted a few seconds and disappeared when she stopped walking. During the following 3 to 4 days pain came on also at complete rest, but improved after 3 weeks. Subsequently it was precipitated by walking uphill or against strong headwinds and by getting into a cold bed. In July and August 1945, while on holiday, she was able to go for long walks without pain, as long as her attention was distracted. Various diagnoses had been made regarding the chest pain, including angina pectoris, hyperthyroidism and neuro-circulatory asthenia.

On Examination.

The woman gave the impression of being highly strung and excitable, and sighed frequently. The pupils were wide and the facial expression was somewhat staring, but there was no exophthalmos or any other sign of hyperthyroidism. There was slight fullness in the neck, but no obvious enlargement of the thyroid. Apart from a short systolic murmur over the apex and base and a slight accentuation of the 2nd pulmonary sound no abnormalities were found on routine physical examination. The blood-pressure was 145/85. Radiological examination of the chest, which included chest films in the postero-anterior and oblique views, showed the heart to be hyperactive;

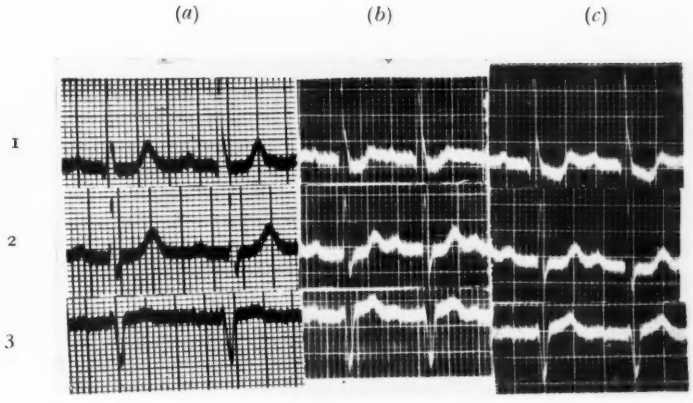


FIG. 1.

1st November, 1945. Patient 3 months pregnant. (*a*) before exercise; (*b*) and (*c*) 1 and 4 minutes respectively after the end of the exercise test. Time, 0.04 and 0.2 sec.

A.S.

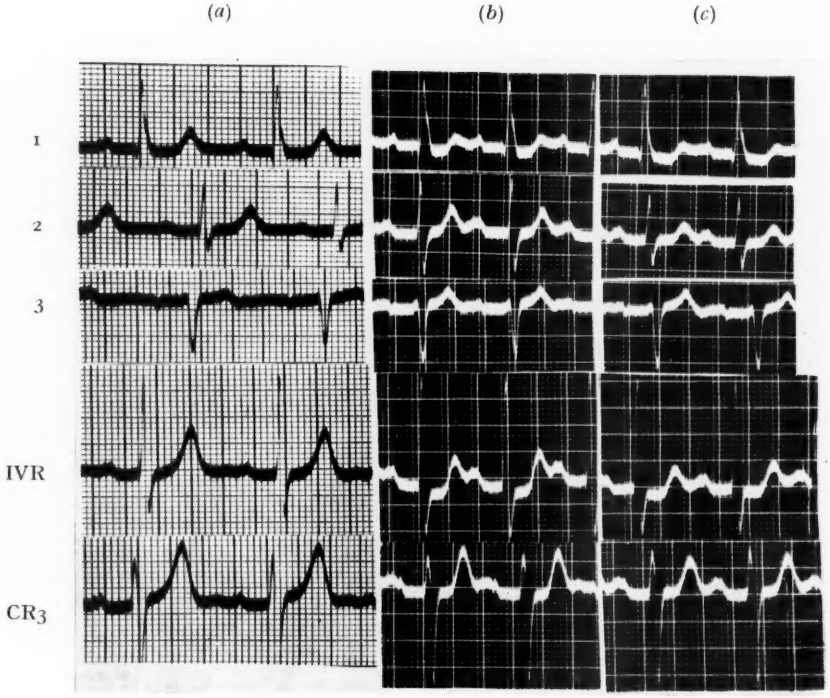


FIG. 2.

16th June, 1947. About 1 year after confinement. (*a*) before exercise, (*b*) and (*c*) after exercise. (*b*) limb leads during the 2nd, chest leads during the 3rd min.; (*c*) limb leads during the 4th, chest leads during the 5th min. after the end of the exercise test respectively. Time, 0.04 and 0.2 sec.

All tracings were taken with the same standard Cambridge electrocardiograph with interchangeable cameras.

A.S.

no other abnormalities were found. A resting electrocardiogram showed sinus rhythm, rate 81, left axis deviation, lengthening of the a-v and inter-ventricular conduction times (P–R: 0.22, QRS: 0.1 to 0.11 second). There was slurring of the descending limbs of the R waves in lead 1 and of the S waves in leads 2 and 3. An exercise test, consisting of walking up and down 2 steps, each 9 inches high, showed diminution of exercise tolerance owing to the early onset of dyspnoea. Very slight pain in the chest occurred after 27 ascents carried out in 1 minute 40 seconds, but though the test was continued until 60 ascents had been carried out in 4 minutes the pain did not increase in severity and disappeared shortly after the end of the test. Subsequent electrocardiograms showed depression of the R–T junction of 1½ mm. below the isoelectric line, gross distortion of the R–T intervals and diphasic, mainly inverted T waves in lead 1, distortion of the S–T intervals in lead 2 and increase in the height of the T waves in lead 3 (Fig. 1), these changes lasting over 7 minutes after the end of the test.

Such changes were clearly indicative of myocardial anoxia, but it was possible, though unlikely, that they were a result of the pregnancy. In view of the rarity of angina of effort in child-bearing women the diagnosis of coronary disease was left open for the time being and the patient allowed to continue the pregnancy under strict medical supervision. The presence of a large psychological element was obvious.

As the writer was unable to find any report on the result of such exercise tests with successive electrocardiograms in cases of pregnancy with normal hearts, 7 patients were examined by means of the same exercise test at Guy's Hospital; in none was there any evidence of heart disease and all were in approximately the same stage of pregnancy. Their ages were 24, 25, 27, 33, 39, 39, and 40 years. With the exception of one patient, in whom the number of ascents was also 60, all performed 100 ascents in times varying from 6 minutes 6 seconds to 7 minutes 41 seconds; none showed signs of temporary myocardial anoxia, but only an increase in rate. In only one case minor changes occurred in lead 1 in the height of the T waves and in the slope of the P–R intervals as well as depression of the S–T junction of ½ mm. below the isoelectric line.

The absence of signs of myocardial anoxia after exercise in pregnant women without any evidence of a cardiac lesion clearly supported a diagnosis of angina of effort in our patient. In order to substantiate it, re-examination several months after delivery was considered desirable.

Pregnancy continued to be uneventful and when seen a few days before delivery the patient had been able to carry out strenuous household duties without any discomfort. Except for changes in the position of the heart, due to the advanced pregnancy, the same findings were obtained on routine examination. A resting electrocardiogram differed from the previous one in that the T waves in lead 1 were slightly smaller and small Q and R′ waves were present in leads 2 and IVR; they were attributable to the change in position of the heart.

For obstetrical reasons the patient was delivered by Caesarean section which she withstood well, discharged from the nursing-home on the 16th day she was able to resume her duties immediately afterwards without difficulty.

When last seen on 16th June, 1947, about 1 year after confinement, pain in the chest came on less frequently and was less severe than previously; it was precipitated mainly by exertion while stooping, but she was able to walk upstairs and out of doors without any discomfort. On examination no significant

changes were found. The blood-pressure was 150/90. A resting electrocardiogram showed the same features as on 1st November, 1945, except for a slightly lower heart rate (75). Another exercise test, in which she again carried out 60 ascents across the same 2-step device, but in 3 minutes 13 seconds (as compared with 4 minutes on the previous occasion) again produced temporary depression of the R–T junction of 1 mm. below the isoelectric line, gross distortion of the R–T intervals and diphasic T waves in lead 1, and increase in the height of the T waves in lead 3; there was also depression of the S–T junction of 2 mm. below the isoelectric line and distortion of the S–T intervals in the apical chest lead IVR (Fig. 2). These signs of myocardial anoxia lasted 15 minutes after the end of the test. Dyspnoea became noticeable after 25 ascents carried out in just over one minute, but except for very slight transient pain in the left wrist after the end of the test no discomfort occurred and precordial pain was absent throughout. There was no evidence of anaemia (haemoglobin 90 per cent Autenrieth); the Wassermann and Kahn reactions were negative; the urine was normal.

Discussion.

While many different kinds of precordial pain are encountered in pregnant women, the number of cases in which a diagnosis of angina pectoris due to coronary disease can be made with any degree of certainty is exceedingly small. This is easily understood if the great rarity of coronary disease in women under 40 is remembered. In all age-groups considered together, the average ratio of male to female patients with coronary disease is about 4:1, whereas in a series of 100 patients under 40 the ratio was 24:1 (Glendy, Levine and White, 1937). Of the 4 women described by these authors 3 had hypertension and only 1 had a normal blood-pressure. The frequency with which cardiac neurosis was superimposed on the organic lesion was emphasized. This pronounced predominance of males with coronary disease in the under-forties is also borne out by Clawson's (1941) investigation on the incidence of types of heart disease among 30,265 autopsies: his figures for the 4th decade were 18 males with coronary sclerosis without hypertension in 2,052 autopsies as compared with 1 female in 1,283, giving the statistically significant difference of an incidence of 0.8 per 1,000 in females as compared with 8.8 per 1,000 in males.

The only condition at all which is known sometimes to cause true anginal pain in pregnancy is aortic regurgitation. Five such cases (4 of rheumatic and 1 of syphilitic origin) were found in the Boston Lying-in Hospital (Hamilton and Thompson, 1941), but in Hamilton's recent report (1947) from the cardiac clinic of this hospital for the first 25 years no mention is made of coronary disease amongst 1,335 pregnant patients with cardiac disease. Amongst 500 women with serious heart disease followed through pregnancy and delivery, only 1 with rheumatic aortic regurgitation and mitral stenosis developed angina from the 7th month, but no details are given (Carr and Hamilton, 1933). In Jones's series (1944) of over 1,000 cases of organic heart disease in pregnancy, no instance of angina of effort occurred. Bramwell and Longson (1938) state that they "have never met with angina pectoris in a woman who was pregnant." A possible case of angina of effort with congestive heart failure is Case 4 of Offergeld (1931), most probably due to syphilis, as the Wassermann reaction was positive in the patient's blood and her father had died of syphilitic heart disease, but neither electrocardiograms nor a post-

mortem report was included in the paper (the patient died suddenly during her 2nd pregnancy). Other cases sometimes referred to as being examples of angina of effort in pregnancy cannot unreservedly be accepted as such, since the published data are inadequate (Budin, 1873; MacLennan, 1933; Tarnier quoted by Leyden, 1893).

Cases of angina of effort in pregnancy without aortic regurgitation, syphilis or any other systemic disease are even rarer. In the present case the changes in the resting electrocardiogram indicated a slight myocardial lesion, probably a remnant of one of the infectious illnesses which the patient had had in the past. The underlying condition most likely responsible for angina of effort and the electrocardiographic changes is coronary sclerosis and the family history of vascular disease tends to support this view. That coronary atheroma may occur in childbearing women, though rarely, is also shown by reports of cases of coronary occlusion in pregnancy (Maggini, 1913; White, Glendy and Gustafson, 1937). Other possible cases are the one of Reis and Frankenthal (1935), though the data given do not seem adequate, and a case of Jensen (1938); in the last case some of the symptoms and the electrocardiograms suggest pulmonary embolism as an alternative and perhaps more likely diagnosis.

SUMMARY.

A case of angina pectoris of effort due to coronary sclerosis in a pregnant woman of 37 is described. The diagnosis of the anginal nature of the pain was based on its relation to effort and particularly on the electrocardiographic changes after exercise, which were indicative of temporary myocardial anoxia and which were found also one year after confinement. Such changes were absent in a group of 7 women in the same stage of pregnancy, without evidence of any cardiac lesion, including 4 in the same age-group. The case also illustrated the value of serial electrocardiograms after exercise; the cardiographic changes indicating temporary myocardial anoxia were obvious as compared with slight and transient pain in the chest or the left wrist.

Grateful acknowledgement is made to Mr. A. J. McNair, Obstetric Surgeon to Guy's Hospital, for his kind permission to examine patients at his Out-patient's Department of the hospital, and to Mr. E. Marx, who was in charge of the patient during her pregnancy and delivery, for kindly giving me access to his notes.

REFERENCES.

Bramwell, C., and Longson, E. A. (1938): *Heart Disease and Pregnancy*. Oxford University Press, London, p. 15.

Budin, P. (1873): *Progrs. Méd., Paris*, **1**, 217.

Carr, F. B., and Hamilton, B. E. (1933): *Amer. J. Obstet. Gynec.*, **26**, 824.

Clawson, B. T. (1941): *Amer. Heart J.*, **22**, 607.

Glendy, R. E., Levine, S. A., and White, P. D. (1937): *J. Amer. med. Ass.*, **109**, 1775.

Hamilton, B. E. (1947): *Amer. Heart J.*, **33**, 663.

Hamilton, B. E., and Thompson, K. J. (1941): *The Heart in Pregnancy and the Childbearing Age*. Little, Brown & Co., Boston, p. 299.

Jensen, J. (1938): *The Heart in Pregnancy*. Kimpton, London, p. 327.

Jones, A. M. (1944): *Post. Grad. med. J.*, **20**, 176.

MacLennan, H. R. (1933): *J. Obstet. Gynaec.*, **40**, 251.

Maggini, E. (1913): *Sem. méd. B. Aires*, **20**, 1397.

Offergeld, H. (1931): *Arch. Gynäk.*, **146**, 533.

Reis, R. A., and Frankenthal, L. E. (1935): *Amer. J. Obstet. Gynec.*, **29**, 44.

Tarnier, quoted by Leyden, E. (1893): *Z. klin. Med.*, **23**, 1.

White, P. D., Glendy, R. E., and Gustafson, P. (1937): *J. Amer. med. Ass.*, **109**, 863.

HEART BLOCK AND PREGNANCY
(A Review)

BY

R. MOWBRAY, M.D., M.R.C.P., D.C.H.,
First Assistant, Department of Medicine, King's College, University of Durham.

NANTA (1914) described the first case of heart block associated with pregnancy in a woman of 28 suffering from congenital syphilis. Since that report 35 cases have been mentioned or reported in the literature. Many of these reports are brief and details are lacking. The purpose of the present paper is to review the published data with a view to finding indications regarding diagnosis, prognosis and treatment, dealing only with cases showing the higher grades of conduction defect.

The published cases have been divided into 2 groups; those due to acquired heart disease (Table I) and those due to congenital heart disease (Table II); each group will be discussed separately.

ACQUIRED HEART BLOCK.

Hamilton (1947) in his recent survey from the Boston Lying-in Hospital gives the incidence of heart disease in pregnancy as 1.8 per cent; chronic rheumatic heart disease accounts for 93 per cent of the cases, congenital heart disease 5.2 per cent, and 1.8 per cent were made up of a miscellaneous group including syphilitic and thyroid heart disease.

Heart block is probably about twice as frequent in males as in females and about 90 per cent of the higher grades of permanent heart block occur after the age of 50 (White, 1944). It is, therefore, obvious that acquired heart block in women of childbearing age must be rare. Indeed Diddle (1941) states that his case was the first observed among 14,000 obstetric admissions over a period of 14 years.

Sprague and White (1927) give the following causes for heart block in young people under 30 years: (1) acute infections (diphtheria, influenza, pneumonia, scarlet fever, typhoid and syphilis), (2) rheumatism, (3) congenital heart disease, (4) trauma, (5) idiopathic.

In the group of published cases 20 were due to acquired heart disease, their ages ranging from 20 to 38 years and the number of pregnancies ranging from 1 to 8. The block was complete in 14, partial in 1, both partial and complete in 2 and not definitely known in 3. It is seen from Table III that half the cases are due to rheumatic infection, a fact easily understood, having regard to the high proportion of pregnancy heart disease due to rheumatism. Other infections accounted for one-fifth of the cases and syphilis a tenth. Coronary artery disease and "myocarditis" accounted for a further 3 cases and Herskovics's (1931) case of abscess of the auriculo-ventricular node is unique.

The immediate maternal mortality for this group of acquired cases was 20 per cent, which is about the same as Hamilton's (1947) mortality for what he calls his unfavourable rheumatic cases. Two of the fatal cases occurred in patients with rheumatic heart disease and the other 2 cases suffered from coronary artery

TABLE I.
CASES OF ACQUIRED HEART BLOCK AND PREGNANCY

Case	Year	Author	Age	Para	Degree of Stock	Aetiology	Delivery	Result
1	1914	Nanta	28	1 & 2	Complete	Congenital syphilis	1. Normal 2. Abortion at 7 months	Mother normal children dead
2	1918	Freund	36	8	? Partial	Rheumatic	Abortion at 4 months	Died
3	1922	Walz	22	1	Complete	Infective	Normal	Normal
4	1923	Allespach and McDowell	22	1	? Complete	Rheumatic	Normal	Normal
5	1927	Laubry	Young	?	Complete	Rheumatic		Normal
6	1927	Langley	?	1	? Complete	Rheumatic		Normal
7	1927	Dressler	30	1	Complete	Infection	Normal	
8	1927	Dressler	36	3	Complete	Myocarditis	Normal	Normal
9	1927	Naujoks	?	3	Complete	Rheumatic	Normal	Normal
10	1928	Clerc and Levy	20	1	Partial and complete	Infection	Normal	Normal
11	1930	Hermann and King	?	6	Complete	? Rheumatic	Normal	Normal
12	1931	Bramwell	21	1	Partial	Rheumatic	Premature Normal	Died
13	1931	Herskovics	20	1	Complete	Abscess of A-V Bundle	Normal	Died
14	1931 (1937)	McIlroy and Rendal (Naish)	?	4	Complete	Myocarditis	Normal	Normal
15	1933	Greenhill	35	1	Complete	Rheumatic	Caesarian	Normal
16	1936	Bernstein	23	1	Complete	Syphilis	Caesarian	Normal
17	1937	Sigler	27	2	Partial and complete	Infection	Normal	Normal
18	1939	Scholder	33	2	Complete	Rheumatic	Caesarian	Normal
19	1939	Ottow	38	2	Complete	Coronary artery disease	Forceps	Died
20	1941	Diddle	30	4	Complete	Rheumatic or syphilitic	Normal	Normal (Died 1 year later)

disease and abscess of the auriculo-ventricular node respectively. It is impossible to state from the available data what effect pregnancy had on the course of the existing heart disease in the immediately favourable cases, but one case is known to have died from heart failure a year after parturition. No estimate can be made of the foetal mortality in these cases. Delivery does not appear to have given rise to any special problems (Table IV).

It would, therefore, appear that the presence of acquired heart block in a given case increases the danger of pregnancy, but it is the general cardiological state of the patient which is of most importance. The heart block is merely another physical sign indicating a certain pathology. All aspects of each case must be assessed and advice given according to well-tried principles. I have no personal experience of cases in this group and many of the case reports are inadequate from a cardiological point of view, but it would appear that the mere presence of heart block in a case is not alone an indication for the termination of pregnancy.

A more detailed analysis of the symptomatology is given by Diddle (1941).

CONGENITAL HEART BLOCK.

Morquio first described congenital heart block in 1901. Since then a large number of cases have been reported, mainly in children but few postmortem examinations have been carried out on proved

TABLE II.

CASES OF CONGENITAL HEART BLOCK AND PREGNANCY

Case	Year	Author	Age	Para	Degree of Block	Type of lesion	Pulse rate	Condition during pregnancy and labour	Type of delivery	Result
1	1927	Jeannin and Clerc	22	1	2:1	? IVSD	36–40	Dyspnoea	Caesarian	Normal
2	1927	Laubry	70	2	Complete	IVSD			Normal	Normal
3	1931	Titus and Stevens	25	1	Complete	? IVSD	44–76	No cardiac failure	Forceps	Normal
4	1931 (1937)	McIlroy and Rendal (Naish)	?	1	Complete	? IVSD		No cardiac failure	Forceps	Normal
5	1933	Taussig, Harvey and Follis (Lemann)	70	?	Complete	?		?	?	Normal
6	1938	Pigford (Jensen)	36	2	Complete	?	40–92	No cardiac failure	Spontaneous abortion 5 months	Normal
7	1941	Hamilton and Thomson	?	?	Complete	?		No cardiac failure	Normal	Normal
8	1941	Hamilton and Thomson	?	3	Complete	?	38	No cardiac failure	Normal	Normal
9	1943	Mitchell, Fettes and Hollander	23	1	Complete	IVSD	62	No cardiac failure. Mild toxaemia & A.P.H.	Normal	Normal
10	1943	Jaleski and Morrison	31	1 & 2	Complete	IVSD	35–68	1. Dyspnoea 2. Normal	Normal	Normal
11	1943	Yeprez	18	1	Complete	? IVSD	36	Normal	Normal	Normal
12	1946	Quintin	27	1 & 2	Complete	? IVSD	36–70	1. Normal 2. Normal	Normal	Normal
13	1948	Mowbray and Bowley	27	1	Complete	ASD	42–50	Dyspnoea and palpitation	Normal Low Forceps	Normal
14	1948	Mowbray and Bowley	27	1 & 2	Complete	? IVSD	45	No cardiac failure	Normal	Normal
15	1948	Mowbray and Bowley	28	1	Complete	?	32–72	Toxaemia	Caesarian	Death

IVSD = Interventricular Septal Defect. ASD = Atrial Septal Defect.

TABLE III.

Aetiology of Heart Block in Pregnancy

Acquired heart block ...		20
Rheumatic	10 (Including Diddle's case)	
Infective	4	
Syphilitic	2	
Myocarditis	2	
Coronary disease	1	
Abscess of A. V. node ...	1	
Congenital heart block ...		15
I.S.V.D. definite	3	
I.V.S.D. probable	6	
A.S.D.	1	
Unknown	5	

clinical cases and fewer long-term follow-up investigations have been done. Campbell and Suzman (1934) reported 8 cases of congenital heart block and suggested that if such cases were followed they would be found in good health at a more advanced age. One of the authors (Campbell, 1943)

TABLE IV.

Deliveries and Maternal Mortality.

	Acquired	Congenital
Normal or forceps	14 (1st delivery in Case 1)	11
Caesarean	3	2
Abortion	2 (2nd delivery in Case 1)	1
Not stated	2	1
Mortality	4	1

carried out such an investigation on 7 cases and found them in good health between the ages of 22 and 42 years. Campbell also states that congenital complete heart block is not a rare condition but is often overlooked because of the relatively fast heart rate of 40 to 56 per minute. I agree with this statement and have seen 4 cases in under 2 years, 2 in women of child-bearing age.

The most frequent congenital cardiac lesion found in cases of congenital heart block is a patent interventricular septum. Heart block has also been described with pulmonary stenosis, aorto-pulmonary patency, dextro-cardia, atrial septal defect, complete transposition of the great vessels with septal defect, and in certain bizarre congenital abnormalities such as the case described by Yater (1929). It can also occur without other demonstrable congenital cardiac abnormality.

The more bizarre types of malformation associated with this condition are of little importance in relation to pregnancy as many of them do not reach maturity, or if they do the symptoms of cardiac disability preclude pregnancy. It is only cases unassociated with gross cardiac abnormalities that we are likely to see. Such cases are those with septal defects, or with no clinically demonstrable cardiac lesion other than the block.

The study of congenital heart disease in pregnancy does not appear to have been carried out in any great detail, probably due to its comparative infrequence, along with the tendency until recently of making a diagnosis of congenital heart disease and leaving it at that. Recent advances in therapy no longer justify this. The incidence of congenital heart disease amongst pregnant cardiacs varies between 1.83 per cent and 5.2 per cent (Mendelson and Pardee, 1941; Jensen, 1939; Hamilton, 1947). Jensen states that the expected incidence of congenital heart disease is 1 in 5,000 deliveries of all types. It is, therefore, obvious that congenital heart block associated with pregnancy must be very rare. In a careful search through the literature I have found 12 cases mentioned by various authors or reported in more or less detail; to this group 3 further cases have recently been added, and these 15 are summarized in Table II.

If we disregard the 2 cases mentioned by Laubry (1927) and Lemann (1933) which were both seen in old age and had heart block which was thought to be congenital, then the age incidence where it is recorded is between 22 and 36 years, and the number of pregnancies varied from 1 to 3. Heart block was complete in all but one case (Jeannin and Clerc, 1927). In several of the recorded cases the congenital abnormality underlying the heart block was not diagnosed but where I have thought the described clinical signs warranted a diagnosis I have filled in this deficiency. On this basis 3 cases suffered from interventricular septal defect, 6 more probably had this defect, 1 had atrial septal defect, while 5 remain undiagnosed (Table III). Pulse rates during pregnancy and labour varied from 35 to 92 beats per minute.

Symptoms and signs of cardiac deficiency are noteworthy by their absence; 3 cases had some dyspnoea on exertion but none showed signs of heart failure. Stokes-Adams attacks were infrequent and when they did occur were mild in character.

Delivery presented no unusual problems and the postpartum progress was normal in all but one case. Six patients had more than one pregnancy without untoward results, but there is no evidence to show whether pregnancy had any long-term adverse effect on the cardiac condition. Two cases were seen at the age of 70 years, one having had 2 children, which may suggest that pregnancy has no adverse effect on the

heart in these cases. The maternal mortality in this series was 6.7 per cent. There is insufficient data to state anything about the foetal mortality.

It would, therefore, appear from a study of the reported cases that congenital complete heart block with or without interventricular or interatrial septal defect does not contra-indicate pregnancy provided there are no signs of cardiac failure present before conception. When such cases are met with they should be treated according to the usual principles regarding pregnant cardiacs and allowed to go to term, being delivered normally or by low forceps, unless obstetric complications require other measures.

A further short comment is required regarding the single case in this group which died following delivery. This case did not show any signs of heart failure during pregnancy but developed toxaemia and hypertension towards the end of pregnancy which had an adverse effect on the pre-existing heart lesion, and, following Caesarean section, congestive cardiac failure occurred which eventually caused her death. Without this complication it seems probable that she would have gone to term and been delivered normally without untoward results.

The diagnosis of heart block either congenital or acquired may cause difficulty during pregnancy if the possibility of its occurrence is not remembered. Electrocardiographic examination is essential for an accurate diagnosis and all cases showing an unexplained bradycardia should be so examined. In cases of acquired heart block there will usually be signs of cardiac abnormality on physical examination, but in cases of congenital heart block there may be no signs and the heart rate may be relatively fast, which may cause a case to be overlooked; congenital cardiacs suspected of having an interventricular septal defect or an atrial septal defect should always be electrocardiographed to exclude the presence of heart block.

The preceding account shows the importance from the prognostic point of view of making an accurate aetiological diagnosis. The prognosis in cases of congenital heart block and pregnancy is almost uniformly good unless complicated by toxaemia, while cases of acquired heart block carry a high maternal mortality and require considerable skill and judgment on the part of both obstetrician and physician if they are to terminate in a favourable manner.

Summary.

1. Thirty-five reported cases of heart block associated with pregnancy have been reviewed; 20 cases were due to acquired heart block and 15 were congenital.

2. The aetiological factors have been described.

3. The diagnosis, prognosis and mortality of both groups is discussed.

I wish to thank Professor F. J. Nattrass for his interest, advice and encouragement in the study of heart block during pregnancy.

I am grateful to Dr. Schade and Dr. Sarmiendo for having helped me with the translation of the German and Spanish papers.

References.

Allespach, W. L., and McDowell, H. C. (1923): *Bull. Buffalo gen. Hosp.*, **1**, 258. (abstr.: *J. Obstet. Gynaec.*, **30**, 479.)

Bedford, D. E., Papp. C., and Parkinson, J. (1941): *Brit. Heart. J.*, **3**, 37.

Bernstein, M. (1936): *J. Amer. med. Ass.*, **106**, 532.

Bramwell, C. (1931): *Proc. R. Soc. Med.*, **24**, 709.

Brown, J. W. (1939): *Congenital Heart Disease.* Bale, London, p. 120.

Campbell, M. (1943): *Brit. Heart. J.*, **5**, 15.

Campbell, M. (1944): *Brit. Heart. J.*, **6**, 69.

Clerc, A., and Levy, R. (1928): *Bull. Soc. méd. Hop. Paris*, **52**, 490.

Corwin, J., Herrick, W. W., Valentine, M., and Wilson, J. M. (1927): *Amer. J. Obstet.* **13**, 617.

Diddle, A. W. (1941): *West. J. Surg.*, **49**, 220.

Dressler, W. (1927): *Wien. Arch. inn. Med.*, **14**, 83.

Dry, T. J. (1937): *Amer. Heart. J.*, **14**, 135.

Fleming, G. B., and Stevenson, M. M. (1928): *Arch. Dis. Childh.*, **3**, 221.

Freund, H. (1918): *Z. Geburtsh. Gynäk*, **80**, 175.

Greenhill, J. P. (1933): *Amer. J. Obstet. Gynec.*, **25**, 125.

Hamilton, B. E. (1947): *Amer. Heart. J.*, **33**, 663.

Hamilton, B. E., and Thomson, K. J. (1941): *The Heart in Pregnancy and the Childbearing Age*. Little and Brown, Boston.

Hermann, G., and King, E. L. (1930): *J. Amer. med. Asso.*, **95**, 1472.

Herskovics, P. (1931): *Zbl. Gynäk.*, **55**, 1460.

Jaleski, T. C., and Morrison, E. T. (1943): *Amer. J. Med. Sci.*, **206**, 449.

Jeannin, C., and Clerc, A. (1927): *Bull. Soc. méd. Hop. Paris.*, **51**, 122.

Jensen, J. (1938): *The Heart in Pregnancy*. Kimpton, London, pp. 114 and 296.

Jordon, F. C., and Randolph, H. (1947): *Amer. Heart. J.*, **33**, 109.

Lampard, M. E. (1928): *Arch. Dis. Childh.*, **3**, 212.

Langley, R. W. (1927): *Califor. West. Med.*, **27**, 193.

Laubry, C. (1927): *Bull. Soc. méd. Hop. Paris*, **51**, 126.

Lemann, I. I. (1933): *Ann. intern. Med.*, **7**, 779.

Leys, D. (1943): *Brit. Heart J.*, **5**, 8.

McIlroy, L., and Rendel, O. (1931): *J. Obstet. Gynaec.*, **38**, 7.

Mendelson, C. L., and Pardee, H. E. B. (1941): *Amer. J. med. Sci.*, **202**, 392.

Mitchell, F. V., Fettes, D. S., and Hollander, A. G. (1943): *Amer. J. Obstet. Gynec.*, **45**, 340.

Mowbray, R., and Bowley, C. C. (1948): *J. Obstet. Gynaec.*, **55**, 438.

Naish, F. C. (1937): *J. Obstet. Gynaec.*, **44**, 659.

Nanta, A. (1914): *Arch. Mal. Coeur*, **7**, 305.

Naujoks, H. (1927): *Z. Geburtsh. Gynäk.*, **91**, 1.

Ottow, B. (1939): *Zbl. Gynäk.*, **63**, 710.

Peel, A. A. F. (1943): *Brit. Heart. J.*, **5**, 11.

Quintin, T. J. (1946): *Canad. med. Ass. J.*, **55**, 600.

Roesler, H. (1934): *Arch. intern. Med.*, **54**, 339.

Scholder, B. M. (1939): *Amer. J. Obstet. Gynec.*, **38**, 320.

Sigler, L. H. (1937): *Amer. J. Obstet. Gynec.*, **33**, 157.

Sprague, H. B., and White, P. D. (1927): *Med. Clin. N. Amer.*, **10**, 1235.

Stein, W., and Uhr, J. S. (1942): *Brit. Heart J.*, **4**, 7.

Taussig, H. B., Harvey, A. M., and Follis, R. H. (1938): *Bull. Johns Hopk. Hosp.*, **63**, 61.

Titus, R. S., and Stevens, W. B. (1931): *Amer. J. Obstet. Gynec.*, **22**, 773.

Turner, L. B. (1947): *Amer. Heart J.*, **34**, 426.

Walz, W. (1922): *Zbl. Gynäk.*, **46**, 1941.

Wendkos, M. H., and Study, R. S. (1947): *Amer. Heart J.*, **34**, 138.

White, P. D. (1944): *Heart Disease*. 3rd edition, Macmillan, New York, p. 925.

Yater, W. M. (1929): *Amer. J. Dis. Child.*, **38**, 112.

Yater, W. M., Barrier, C. W., and McNabb, P. E. (1933): *Ann. intern. Med.*, **7**, 1263.

Yater, W. M., Lyon, J. A., and McNabb, P. E. (1933): *J. Amer. med. Ass.*, **100**, 1831.

Yeprez, C. G. (1943): *Rev. Obstet. Ginec.*, **3**, 1.

CONGENITAL COMPLETE HEART BLOCK COMPLICATING PREGNANCY

(A Report of Three Cases)

BY

R. MOWBRAY, M.D. M.R.C.P., D.C.H.
First Assistant, Department of Medicine, King's College University of Durham,

AND

C. C. BOWLEY, M.B., B.S., D.(Obst.)R.C.O.G.
Resident Medical Officer, Princess Mary Maternity Hospital, Newcastle-on-Tyne.

CONGENITAL complete heart block complicating pregnancy is a comparatively rare combination; it was first described by Jeannin and Clerc in 1927, and since then several further reports have appeared in the literature. Three examples of this condition are described here.

CASE 1. A married primigravida, aged 27 years, was admitted to the Princess Mary Maternity Hospital on 1st July, 1947, for heart disease and bradycardia. She was about 36 weeks pregnant, with no past history of serious illness, and is the 4th member of a healthy family of 8. As a schoolgirl she suffered from breathlessness on exertion, and at 19 she had her first Stokes-Adams attack while hurrying to work. These attacks continued to occur at varying intervals and were often precipitated by over-exertion and rising in the morning, but occasionally they occurred at rest. She married at the age of 21 and in May 1946 was seen by Dr. Evan Bedford, who diagnosed atrial septal defect with complete heart block and mild cardiac failure.

During her pregnancy she complained of fatigue and palpitations and had spent part of each day resting in bed. There had been no cyanosis, cough, haemoptysis, oedema or Stokes-Adams attacks. After admission to hospital she was kept in bed and went into spontaneous labour on 1st August. Labour lasted 9 hours and ended with a low forceps delivery of a normal male infant weighing 7 pounds. Her condition was excellent throughout and her heart-rate remained at 52 per minute. The puerperium was normal and the woman breast fed her infant until after discharge from hospital on 15th August.

Examination while in hospital showed her to be well nourished, normally developed and in good general condition without cyanosis or oedema. Her pulse rate varied between 40 and 64 beats per minute and she was afebrile throughout. The blood-pressure was 140/70. Jugular venous pulsations were easily seen and were about twice as frequent as the apex beat, which was situated in the 6th left interspace, 4½ inches from the midline. There was a slow heaving impulse in the 2nd and 3rd left interspaces about 1 inch from the sternal border. Percussion revealed considerable cardiac enlargement both to the right and to the left. A systolic thrill was present at times in the right supraclavicular region and was constantly present over the left 2nd and 3rd interspaces, being maximal about 1 inch from the sternal border. A rough systolic murmur could be heard all over the praecordium and faintly in the interscapular region; this murmur was most intense over the left 2nd interspace close to the sternum, where a faint diastolic murmur could also be heard. At times a diastolic "noise" could be heard which was thought to be due to the auricular beat. There was no abnormal accentuation of the heart sounds.

The liver was neither enlarged nor tender and urinary output was satisfactory.

Examination of the other systems revealed no abnormality.

Urine analysis was normal. The Wassermann reaction was negative. Red blood cells were 5,080,000; haemoglobin was 98 per cent; colour index 0.96; white cells 13,400; and a blood film showed no abnormality.

Radiological examination carried out during the puerperium showed a generalized enlargement of the heart, with enlargement of the pulmonary artery and its branches. The right auricle was enlarged and displaced to the right. The aorta was hypoplastic, the lung fields were normal. These findings are in keeping with a diagnosis of atrial septal defect (Fig. 1).

Electrocardiograms taken on the 22nd July and 14th August show the presence of complete heart block with a ventricular rate of 43 to 50 per minute and an auricular rate of 100 to 120 per minute. The auricular waves are large and there is notching of the ventricular complexes in Lead 2 (Fig. 2).

The patient returned for re-examination on 19th December, 1947, when she stated that she was well, without breathlessness or other symptoms. Physical examination of the cardiovascular system showed no significant change from the previous examination. Screen and radiographic examination, however, revealed the general cardiac dimensions to be slightly larger, and an electrocardiogram was similar to those previously recorded.

CASE 2. A married primigravida, aged 27 years, was admitted to the Princess Mary Maternity Hospital on 3rd September, 1943, about 39 weeks pregnant. She had always been in good health and had taken a normal amount of exercise without symptoms. Her only previous illness was measles when a child. During pregnancy there had been no dyspnoea or palpitations, but during the 2 weeks prior to admission she had slight oedema of the feet. Because of the bradycardia, which was noticed at the antenatal clinic, the woman was referred in August 1943 to the Royal Victoria Infirmary, where a diagnosis of congenital heart block was made. After admission to hospital she was kept at rest in bed and went into spontaneous labour on 13th September. Labour lasted 15 hours and ended in the normal delivery of a mature male infant weighing 7 pounds. The puerperium was normal. She breast fed her infant and was discharged on 25th September.

Examination while in hospital showed her to be a normally developed healthy woman. The heart rate was 46 beats per minute and regular; the blood-pressure 140/74. The apex beat was in the 5th left interspace, 4 inches from the mid-line, and percussion revealed no cardiac enlargement. On auscultation only a basal systolic murmur was heard. Examination of the other systems revealed no abnormality. The urine showed a persistent trace of albumin until delivery; the Wassermann reaction was negative.

Radiological examination carried out during pregnancy showed some enlargement of the left ventricle, otherwise the heart appeared normal.

An electrocardiogram taken during pregnancy shows the presence of complete heart block with an auricular rate of 120 per minute and a ventricular rate of 45 per minute. The P and T waves are large (Fig. 3).

This patient was re-admitted to hospital in labour on 6th March, 1945, at the end of her 2nd pregnancy, during which she had slight oedema of the feet but no other symptoms. Her blood-pressure had varied between 130/80 and 170/70 with a trace to 1 plus of albumin in the urine. Heart rate varied round 44 beats per minute and the physical signs in the cardiovascular system were the same as during her 1st pregnancy. After a normal labour she was delivered the same day of a mature female infant weighing 6 pounds 11 ounces. The puerperium was normal and she breast fed her infant, being discharged from hospital on 19th March.

Since her second pregnancy she has remained in good health, and physical examination reveals no change in her cardiac condition from that reported above.

CASE 3. E. H., aged 28 years; married; primigravida.

This patient was admitted to the Jessop Hospital for Women, Sheffield, on 16 April, 1946, 31 weeks pregnant, suffering from toxaemia. She had spent 1 month in bed during her pregnancy following a threatened abortion during the 3rd month, but

apart from this had been free of symptoms until just before admission. She gave a history of heart trouble since infancy and when 11 years old was diagnosed as a case of congenital heart block at Sheffield Royal Hospital. She had scarlet fever at the age of 11 and sciatica when she was 27. Between the ages of 13 and 18 she suffered from infrequent Stokes-Adams attacks, but from that time onwards was free from symptoms.

On admission her general condition was fair, she was pale and slightly cyanosed. There were no signs of congestive heart failure. The pulse was regular at 39 beats per minute. Blood-pressure was 170/80. The heart was enlarged to the left with the apex beat in the 6th space in the anterior axillary line, and a systolic murmur was heard all over the praecordium with maximum intensity at the apex.

Examination of the other systems revealed no abnormality.

Urine contained 0.45 per cent of albumin. Wassermann reaction was negative. Red-blood cells were 4,050,000. Haemoglobin was 70 per cent. Colour index 0.86.

Radiological examination showed the heart to be enlarged to the left with enlargement of the pulmonary artery and increased vascular markings in the lung fields (Fig. 4).

Electrocardiograms were taken on the 4th and 7th May, the first showed 4 : 1 heart block and the second complete dissociation between the auricles and ventricles. Auricular rates varied between 120 and 130, and ventricular rates between 32 and 40. There were no other significant abnormalities in the cardiograms (Fig. 5).

She was rested in bed but her condition did not improve, the toxaemia increased and her urinary output diminished while the blood-pressure rose to 190/68 and cyanosis increased. Her pulse-rate varied between 36 and 48 beats per minute, orthopnoea developed and albuminuria increased, but there was no oedema. On 5th May a Caesarean section and sterilization were performed under local anaesthesia, a premature live male infant being delivered. During the operation the patient had a Stokes-Adams attack. Following operation her condition temporarily improved but by the 14th May she was definitely worse. Her blood-pressure was 194/82, cyanosis was more obvious and there was increasing orthopnoea with signs of pulmonary congestion. The urinary output decreased, oedema developed and the liver became enlarged and tender. On the 20th she had a further Stokes-Adams attack, after which her pulse rate temporarily increased to 72 beats per minute. On the 23rd she discharged herself from hospital against medical advice and died 3 days later at home following 2 further Stokes-Adams attacks; no autopsy was obtained.

Discussion.

Congenital heart block was described by Morquio in 1901, but it still does not seem to be realized that it is not an excessively rare condition in adults, and is one in which the prognosis is relatively good. Campbell (1943) stated that it is probably often overlooked because of the relatively fast heart rate of 40 to 56 beats per minute. Regarding its association with pregnancy, a careful search through the literature has revealed 12 cases mentioned by various authors or reported in more or less detail, which seems to show that its recognition is rare in the pregnant woman.

The most frequent associated anatomical defect is a patent interventricular septum, but heart block has also been described with pulmonary stenosis, aorto-pulmonary patency, dextrocardia, atrial septal defect and other more bizarre congenital abnormalities. It can also occur without other demonstrable cardiac lesion. We have been unable to find a case reported where congenital heart block and atrial septal defect complicated pregnancy as in our first case, where the physical signs, radiological and electrocardiographic changes fitted with the classical description of this condition. The second case was only diagnosed late in pregnancy after the bradycardia had been noticed at the antenatal clinic. She had had no previous symptoms of heart disease and was not aware of her condition. It seems probable that an interventricular defect was the associated anatomical abnormality in

FIG. 1.

Case 1. Postero-anterior view of chest.

R.M.

FIG. 2.
Case 1. Electrocardiogram.

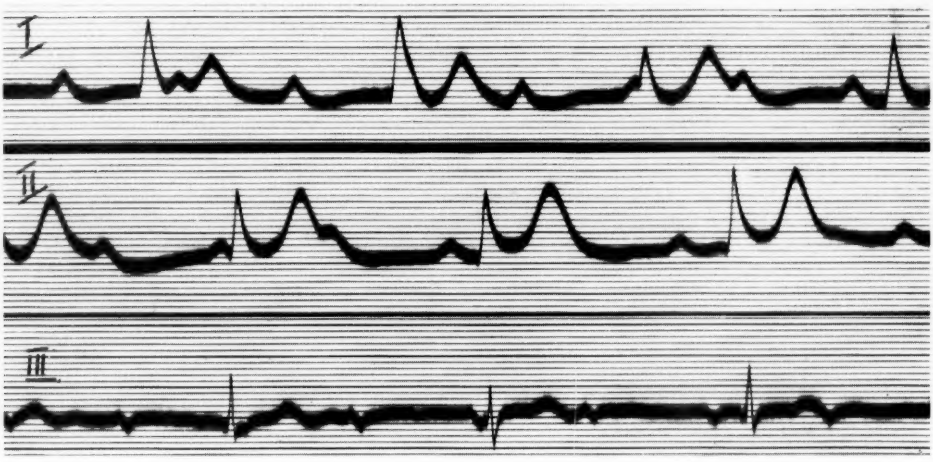


FIG. 3.
Case 2. Electrocardiogram.

R.M.

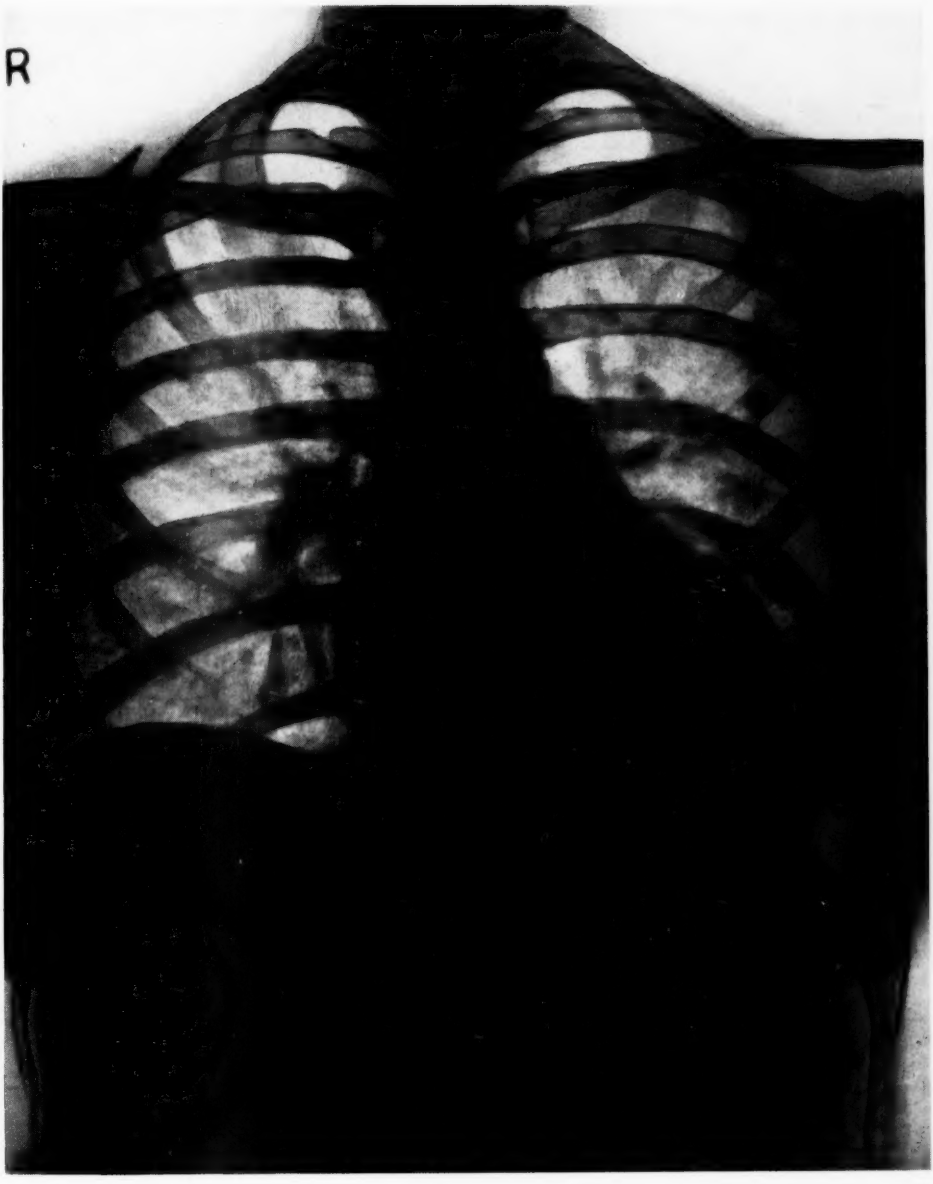


FIG. 4.

Case 3. Postero-anterior view of chest.

R.M.

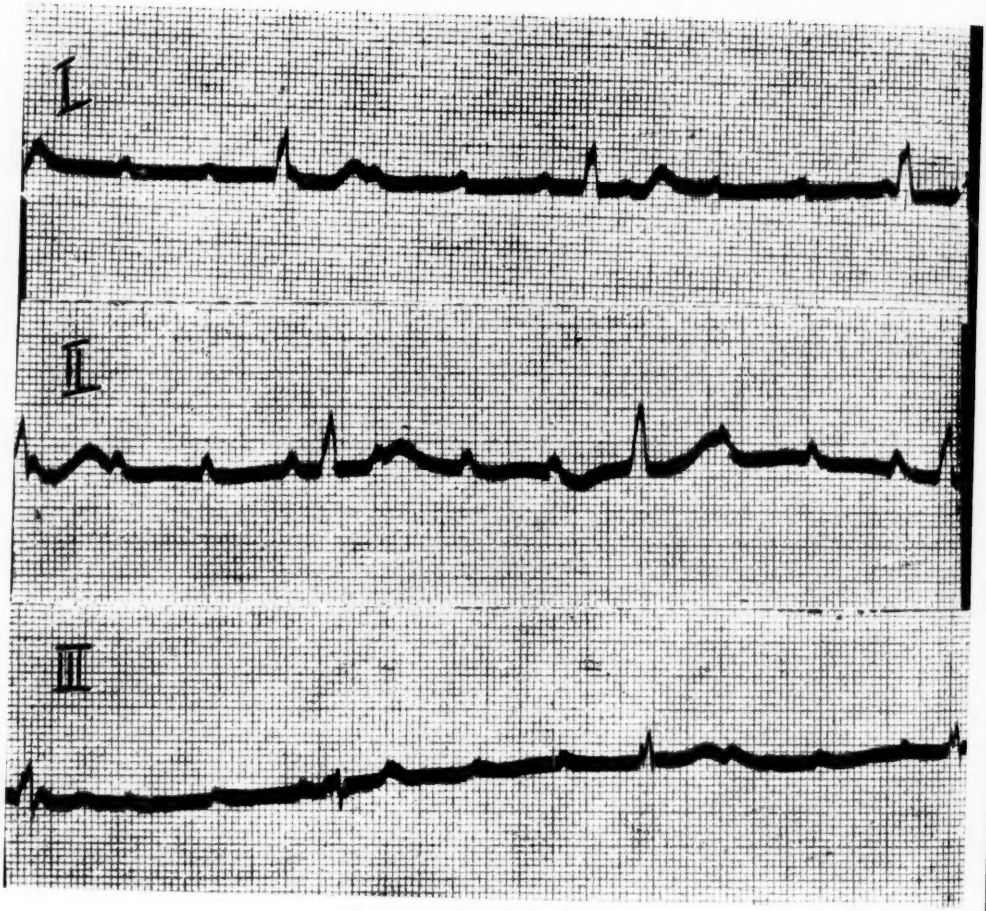


FIG. 5.

Case 3. Electrocardiogram.

R.M.

her case. The third case was already known to be suffering from congenital heart block, but on the data available it is impossible to state what the underlying anatomical condition was. The first 2 cases showed ventricular rates over 40 per minute while the third case varied from 32 to 72 beats per minute following a Stokes-Adams seizure.

Stokes-Adams attacks in cases of congenital heart block are less common and less severe than in acquired heart block, In spite of their occurrence in our third case there is no indication that they are generally of a bad prognosis in cases such as those under consideration.

The third case illustrates the possible effect of a complicating toxaemia of pregnancy with hypertension on an already abnormal heart. There seems little doubt that in this case cardiac failure from which the patient died was precipitated, not primarily by the pregnancy, but by the toxaemia and hypertension; if these had not ensued it is more than probable that the patient would have passed through a normal labour and survived. The second case also showed a mild degree of toxaemia in both her pregnancies which was insufficient in degree to affect adversely the cardiological condition.

SUMMARY.

Three cases of congenital heart block complicating pregnancy are described and discussed.

REFERENCES.

Bedford, D. E., Papp, C., and Parkinson, J. (1941): *Brit. Heart J.*, **3**, 37.

Brown, J. W. (1939): *Congenital Heart Disease*. Bale. London; p. 120.

Campbell, M. (1943): *Brit. Heart J.*, **5**, 15.

Jeannin, C., and Clerc, A. (1927): *Bull. Soc. méd. Hôp., Paris*, **51**, 122.

THE VERNIX CASEOSA AND SUBNORMAL TEMPERATURE IN PREMATURE INFANTS

BY

COLMAN SAUNDERS, M.B., B.A.O., B.Sc.

Paediatrician to the National Maternity Hospital, Dublin;
Paediatrician to the Coombe Lying-in Hospital, Dublin

IN spite of modern methods of nursing and incubation, including various forms of treatment, the problem of persistent subnormal temperature in the premature infant still remains to be completely solved.

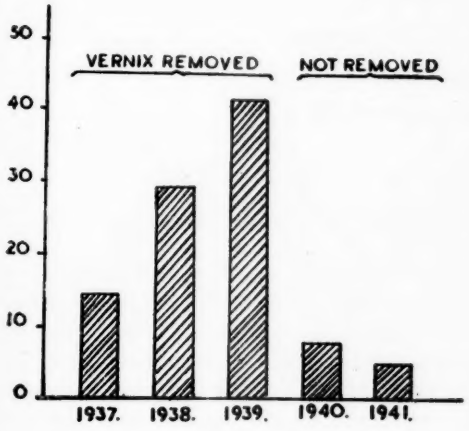
We approached this difficulty in the National Maternity Hospital, Dublin, after the establishment of a modern incubator room with thermostatic control and added incubator equipment had not resulted in any marked success for some time. Thyroid gland was used but the results were not conclusive. A diarrhoeic effect was noted in most cases in which this latter treatment was administered and, in the case of the few infants that showed improvement, it was difficult to say whether this improvement was fortuitous or not. Oestrogenic preparations were tried both by mouth and parenterally with similar inconclusive and unsatisfactory results. The question then arose as to whether in the majority of cases this subnormal temperature was due to dysfunction of a poorly developed thermal centre, to a subnormal metabolism, to abnormal heat loss or to a combination of factors. We finally decided to investigate the prevention of abnormal heat loss.

When the premature and thermo-labile infant is deprived of its vernix after birth, it is left with a highly hyperaemic red skin surface which can possibly radiate considerably more heat than the infant can control with its poorly developed resources.

An experiment was made in which the vernix was not removed but was allowed to separate in a natural way. The procedure adopted was as follows: After birth, the cord was dressed and the baby, wrapped in heated blankets, was transferred to the incubator room, where it remained undisturbed for a couple of hours to allow for any condition of shock following delivery, the usual treatment being given when necessary. After this rest the baby was dressed and the vernix allowed to separate, which it did in most cases by the 5th day, except in the folds of the body such as the neck, groin, axilla, etc., where the separation was not complete until about the 10th day. It is interesting to note that these areas being rather hotter and moister than the rest of the body surface and consequently more liable to surface infection, were last to shed their vernix. After the natural separation of the vernix, there was little, if any, of the superficial hyperaemic condition invariably present following its

forcible removal and the skin showed good keratinisation which had taken place under the vernix.

An investigation into the results of this technique has shown a considerable reduction in the number of cases of subnormal



The actual figures were as follows:

Year	No. of infants	No. with subnormal temperature	Percentage
Vernix removed			
1937	35	5	14.2
1938	24	7	29.1
1939	63	26	41.2
Vernix not removed			
1940	68	5	7.3
1941	22	1	4.5

temperature since its introduction in 1940. The daily temperatures for the first 7 days of 212 infants under 5 pounds admitted to the infants department, without any case selection, have been noted for the years 1937–38–39–40 and 1941, and the numbers of infants showing persistent temperatures below 97°F. ascertained for the whole of the first week. The foregoing chart shows the comparative incidence of subnormal temperature in the years before and after the adoption of this technique.

It would appear that the vernix caseosa, apart from being a protective covering to a skin possibly partially permeable to bacteria before keratinisation, may influence heat control, particularly in the premature infant, by the reduction of radiation from the underlying surface. This surface with its very poor, or absent, adipose layer is covered by nature with a greater or lesser degree of vernix caseosa and if not stimulated by friction is partially protected by the vernix; on the other hand if this natural overcoat is removed and the efficiency of the poorly developed thermal control further strained by producing a hyperaemic body surface by the friction required, it is conceivable that the heat loss entailed is more than the poorly developed resources of the premature can cope with.

Subsequent to this investigation an interesting point has been raised by Lajos and Szontagh (1947), who produce evidence to show that the vernix probably contains substances which may be of benefit to the infant, notably oestrogen, which they demonstrated by producing full oestrus in infantile ovariectomized rats both by injection and inunction of vernix caseosa. As the latter route was also effective it would suggest that the skin of the newborn is also permeable to vernix. If so, the removal of the vernix may, apart from possibly increasing heat loss, perhaps deprive the infant of valuable intrinsic substances and also uncover a poorly keratinised skin surface that may on occasions, particularly in the areas described, be also permeable to bacteria. Whether fortuitous or not it is of interest to note that a considerable drop in the incidence of infection of unknown origin

has been observed since the introduction of this procedure, which is now routinely observed in both mature and premature infants.

It may also be recorded that no incubators have been used in the hospital since 1940, with no deleterious effect on the premature mortality. The routine methods of maintaining body temperature, apart from incubators have, of course, been observed.

REFERENCE

Lajos, L. and Szontagh, F. (1947): *Z. Vitamin-, Hormon- u. Fermentforschung*, **1**, 81.

THORACOPLASTY AND PREGNANCY—WITH SPECIAL REFERENCE TO CHILDBIRTH

(A Preliminary Report)

BY

J. PETRIE MCINTYRE, M.D.,
Robroyston Hospital, Glasgow

INTRODUCTION.

IN the campaign against pulmonary tuberculosis, modern measures of collapse therapy have played a prominent part. With sanatorium regimen, they have changed radically the management of patients with phthisis. Moreover, recent advances in the operative technique of thoracic surgery have helped to clarify not only the limitations but the various combinations of the many highly specialized methods of treating tuberculosis. As a result, these surgical procedures are now practised widely and extensively, with marked success, on the tuberculous female patient of childbearing age. In bilateral, as in unilateral, lesions they have given gratifying results.

This present investigation is concerned with the reciprocal relationships of pregnancy and thoracoplasty. Twelve tuberculous pregnant females are included in the study.

With one exception, their advanced cavernous lung lesions were treated by thoracoplasty prior to conception. All were delivered in Robroyston Hospital, Glasgow, during the period February 1947 to March 1948. Conclusions drawn are derived from a critical evaluation of available comparative clinical and radiological data, recorded before, during and after the onset of pregnancy.

REVIEW OF THE LITERATURE.

References on the relations of thoracoplasty and pregnancy are not numerous. Careful search of medical literature by the author resulted in his finding only 31 such instances recorded. Alberts (1932), Jessen (1929), Hiebert and Hastings (1932), Haymaker (1934), Vannucci (1934), and Boquist, Simons and Myers (1935), are each credited with a single publication relating to pregnancy following thoracoplasty. Intervals between the operation and date of delivery reported by them varied from 11 months to 6 years. Busch (1930), Jessen (1932), followed next with 2, cases each. In Busch's cases the intervals were 1 and 1½ years; and in Jessen's cases 7 months and 5 years. Seven examples of thoracoplasty following pregnancy were cited by Blisnjanskaja and Lasarevitch (1936). In their case reports thoracoplasty antedated the onset of pregnancy by periods varying from 2 to 4 years. Lastly Seeley, Siddall and Balzer (1940) published 10 cases of pregnancy following thoracoplasty. In only 6 of these did the pregnancy proceed to term. Once again the operation preceded the pregnancy by 2 to 4 years approximately. Quoting these same authors it is of interest to note that Sayé, Rist, Amorin, and Guillemin each reported 1 instance in which thoracoplasty was actually performed during pregnancy.

Results of Treatment.

The ages of the patients under discussion varied from 23 years to 32 years. There were 7 multiparous and 5 primiparous patients. A two-stage, seven-rib thoracoplasty was performed on each patient included in this study. With one exception, this operation was done on the left side of the chest. The interval between the thoracoplasty and the onset of pregnancy was variable. But for 1 patient who received this operation when she was $3\frac{1}{2}$ months' pregnant, the interval varied from 1 to 10 years. Table I outlines the special

Table I.

No.	Name, age, parity	Thoraco-plasty	Delivery		Labour			Infant weight at term (in kilos.)	Remarks
			Date	Type	Duration Hr.	Duration Min.	Compli-cations		
1.	I.H. age 28 Para. 3	1940	1947	Spontaneous	10	40	None	4.2	Nil.
2.	M.M. age 26 Para. 1	1942	1947	Spontaneous	4	0	None	2.8	Nil.
3.	M.M. Age 23 Para 1	1942	1947	Low forceps	7	5	Uterine inertia	3.1	Nil.
4.	H.M. age 32 Para. 3	1947	1947	Low forceps	4	40	Slight dyspnoea	3.1	Thoracoplasty done at 3½ months
5.	E.W. age 26 Para. 2	1946	1947	Spontaneous	13	45	None	2.6	Delivery 14 months after operation
6.	R.S. age 30 Para. 3	1941	1947	Spontaneous	18	0	None	3.6	Infant died
7.	I.B. age 27 Para. 2	1944	1947	Low forceps	26	35	Slight dyspnoea	3.4	Slight exacerbation of lung lesion
8.	J.F. age 25 Para. 1	1943	1947	Low forceps	13	0	Uterine inertia	3.0	Nil.
9.	M.K. age 28 Para. 1	1943	1948	Low forceps	14	25	Uterine inertia	2.6	Nil.
10.	L.G. age 30 Para. 2	1946	1948	Spontaneous	1	40	None	3.7	Delivery 1½ years after operation
11.	A.G. age 29 Para. 1	1937	1947	Low forceps	11	40	Uterine inertia	3.7	Nil.
12.	A.W. age 26 Para. 3	1944	1947	Spontaneous	9	5	None	3.7	Nil.

features relating to the 12 patients under discussion. Complaints noted were: 2 with slight staining of the sputum during the first trimester, and 1 with acute right-sided pain, 14 days prior to delivery. In this latter patient pleurisy was diagnosed. The average duration of labour was 15 hours 15 minutes. The shortest time recorded was 1 hour 40 minutes, the longest 26 hours 35 minutes. Instrumental delivery was performed in 6 patients. The remainder were delivered spontaneously. Slight dyspnoea was observed in 2 patients towards the end of the 2nd stage of labour. The placenta in each instance was expelled complete and no excessive bleeding was reported. No puerperal sepsis occurred.

Discussion of the Results.

Pari passu with the marked improvement in the operative technique of chest surgery, together with the recent advances in preventive medicine and in the practice of obstetrics during the past decade, a reorientation of views on the relations of pregnancy in the course of pulmonary tuberculosis has taken place. By and large, a more conservative approach has been made to meet the problem of pregnancy in the phthisical patient. Following this modern trend, a policy of non-intervention was practised in the 12 tuberculous patients included in this study. Radiological evidence confirmed the adequacy of the anatomical collapse initiated by this operation. Notwithstanding the great strain imposed on the cardiac and respiratory functions in the first instance by thoracoplasty, and in the second by the gravid uterus, severe dyspnoea, as reported by Boquist *et al.* (1935), was not a striking feature in this series of patients. Respiratory embarrassment of moderate degree was observed in one patient who developed pleurisy 14 days prior to delivery. In 2 others it was slightly manifest at the height of the voluntary expulsive efforts characteristic of the second stage of labour.

From observations recorded in this study distressing dyspnoea would seem to be largely hypothetical. Accordingly, *per se*, it should not justify therapeutic interruption of the pregnancy in patients with thoracoplasty. This is not in keeping with the view held by Jameson (1935). From observations, based on 11 case reports, he concluded that the respiratory embarrassment observed during labour in these patients was not a negligible hazard. On the contrary, it was more to be feared than exacerbation of the underlying lung lesion. Comparative chest radiograms during gestation, the immediate postpartum period, and after an interval of 3 months approximately following delivery, revealed evidence of pulmonary progression in only one instance. This latter patient, suffering from a right-sided pleurisy, failed to report for medical examination until she was almost at term. Consequently it is not inconceivable that the slight exacerbation of the lung lesion in this patient is not unrelated to her failure to attend for the all-important prenatal care and supervision. Contrary to the reports of Seeley *et al.* (1940) prematurity was absent in this study. Infants were born at term. Recorded weights at birth varied from 2.6 kilogrammes to 4.2 kilogrammes. One neonatal death, from gastro-enteritis, was reported within the first 3 months after delivery. No deaths have been recorded among the mothers.

Bearing in mind the fact that collapse therapy does not eradicate tuberculosis, but only creates favourable conditions which promote healing, advice regarding pregnancy in patients with thoracoplasty cannot be given without reservation. Suf-

ficient time should elapse to ensure healing of the lesion before condoning pregnancy. Given a patient, however, with a tuberculous lung lesion adequately and anatomically collapsed by thoracoplasty, coexisting pregnancy, as shown by this study, need not necessarily be regarded as a severe imposition on the maternal organism.

Summary.

Observations on the relations of pregnancy in 12 tuberculous patients with thoracoplasty are recorded. A review of relevant medical literature is also included. Deserving of special mention is the one case in which thoracoplasty was performed during pregnancy. Complaints during the gestational period were few, there being 2 with blood-stained sputum and one with pain in the right side chest. Respiratory embarrassment of slight degree was noted in 2 patients during labour. Deductions drawn from this small series of cases subscribe to the feasibility of pregnancy in the patient with thoracoplasty.

The author wishes to express his thanks to Dr. W. Armstrong, visiting consultant obstetrician, Robroyston Hospital Glasgow, for the keen interest he has shown in this study, and for his expert management of the confinements.

References.

Alberts, L. (1932): *Med. Welt.*, **62**, 1137.

Blisnjanska, A. I., and Lasarevitch, A. I. (1936): *Gynéc. Obstét.*, **34**, 207.

Boquist, H. S., Simons, J. H., and Myers, J. A. (1935): *Amer. Rev. Tuberc.*, **31**, 48.

Busch, F. (1930): *Beitr. Klin. Tuberk.*, **74**, 223.

Haymaker, W. (1934): *J. thorac. Surg.*, **3**, 322.

Hiebert, J. P., and Hastings, D. R. (1932): *J. Lancet*, **52**, 328.

Jameson, E. M. (1935): *Gynaecological and obstetrical tuberculosis*. Lea and Febiger, Philadelphia.

Jessen, F. (1929): *Z. Tuberk.*, **53**, 214.

Jessen, H. (1932): *Z. Tuberk.*, **63**, 182.

Seeley, W. F., Siddall, R. S., and Balzer, W. J. (1940): *Amer. J. Obstet. Gynec.*, **39**, 51.

Vannucci, G. C. (1934): *Gazz. int. med.-chir.*, **44**, 154.

PREDIABETIC PREGNANCY

BY

H. H. FOURACRE BARNS, F.R.C.S., M.R.C.O.G.,

Assistant in Obstetric Unit at University College Hospital;
Honorary Obstetric and Gynaecological Surgeon,
Queen Mary's Hospital for the East End, Stratford;

AND

M. E. MORGANS, M.B., M.R.C.P.,

Assistant in the Medical Unit at University College Hospital.

IT has been recognized for some time that pregnancies in women who subsequently develop diabetes mellitus are associated with high foetal mortality-rates and large infants. Allen (1939) studied the obstetric records of patients having pregnancies complicated by diabetes and what he called a "benign type of glycosuria", and found that in pregnancies occurring long before the glycosuria became manifest there was a high incidence of large infants and an increased foetal mortality. He suggested that "glycosuria is only another or perhaps later manifestation of a condition that may produce larger babies and sometimes kills them before birth." Miller (1945a) showed, in women who developed diabetes in or during the fifth decade, that the average birth-weight and neonatal death-rate of infants born before the onset of the disease was greater than that for the control series. Herzstein and Dolger (1946) investigating the stillbirth-rate and neonatal mortality-rate over 20 years in a series of women who subsequently developed diabetes (prediabetic), found an increase in both in the 5 years period immediately before the disease appeared, but not in the preceding 15 years. The increased foetal mortality-rate among women who later developed diabetes was apparently uninfluenced by the severity of the diabetes when it appeared.

In considering the aetiological factors concerned in the production of the large and vulnerable infant of the diabetic pregnancy it is obviously of great importance to establish whether these reports are typical of general experience. We have therefore examined the records of our diabetic patients from this point of view.

The group examined consisted of pregnant, diabetic women who had attended the Obstetric Unit of University College Hospital, and women who had attended or were attending the Diabetic Clinic of the hospital. As some authorities believe that the diabetes is of a different type in the menopausal and elderly patient, those women who developed the disease after the age of 45 were considered separately. Excluding these, there was a total of 43 patients who had had 90 pregnancies before the onset of diabetes.

FOETAL BIRTH-WEIGHTS.

The average birth-weight of 33 infants delivered of women in these prediabetic pregnancies was 3,607 g. (SD = ±191.8).

The average birth-weight of a series of matched controls was 3,292 g. (SD = ± 112.8). Although the difference is not statistically significant, the figures lend support to the findings of Allen (1939) and Miller (1945a and 1946) that the infants of women in prediabetic pregnancies tend to be larger than normal.

Foetal Mortality.

The results of the 90 prediabetic pregnancies were: abortion, 12; intrauterine death of viable foetus, 10; neonatal death, 6; alive, 63 (including 1 pair of twins).

The rate of abortion was, therefore, approximately 1 in 8 pregnancies (13.3 per cent). This is comparable with the incidence of 12.3 per cent given by Herzstein and Dolger (1946) for 714 prediabetic pregnancies, of 14 per cent in a series of 50 pregnancies in women with established diabetes at the Obstetric Hospital, and 11.8 per cent in a study of early non-diabetic pregnancies at the Obstetrical Hospital (Barns, 1947). The data showed that there was no significant difference in the abortion-rate in the prediabetic, diabetic and non-diabetic pregnancies.

The late total foetal mortality, consisting of stillbirths and neonatal deaths but excluding abortions, in this small series of 90 pregnancies was 16 in 78 pregnancies, an incidence of 20.5 per cent. This figure is a little higher than that of 15.4 per cent given by Herzstein and Dolger for the 5 years immediately preceding the onset of the diabetes. The late total foetal mortality rate for the 50 diabetic pregnancies already mentioned was 50 per cent. In 2,298 consecutive non-diabetic deliveries observed at the Obstetric Hospital between 1939 and 1941 the late total foetal mortality rate was 6.4 per cent. The rate for the prediabetic pregnancy was therefore lower than that for the diabetic pregnancy but higher than that for pregnancies in general, findings which are in keeping with those of other published work.

Since the rate of abortion for such pregnancies was the same as for otherwise normal pregnancies, it follows that the high proportion of deaths among the foetuses and newborn in pregnancies before and after the onset of diabetes must be caused by some unknown factor or factors which affects the viable foetus in the later weeks of pregnancy.

It has already been mentioned that Herstein and Dolger found that the first 5-year period before the onset of diabetes (prediabetic period) showed an increased stillbirth and neonatal-death rate, but that the preceding 15 years did not show such a tendency. The pregnancies were, therefore, investigated from this point of view. Table I shows the total late foetal mortality-rates for the pregnancies in 5-year intervals before the onset of the diabetes. As judged from this small series it would appear that the total late foetal mortality rate commences to increase above that for non-diabetic pregnancies 15 years before the onset of diabetes and continues to increase as the onset is approached. There is, of course, a gradual increase in the average age of the mother at the time of the pregnancy as the onset of the diabetes is approached. This is to be expected since diabetes is found to occur more commonly in the later part of the childbearing period (Barns, 1941). The difference in the average age of the mother at the time of the pregnancy for the various groups is, however, small and by itself cannot be considered to account for the great increase in the total foetal mortality-rate as the onset of diabetes is approached. To check this, the total foetal mortality-rate for prediabetic pregnancies, and pregnancies in general, according to the average age of the mother at the time of the pregnancy, in 5-year periods, were compared and shown

TABLE I.

Total Late Foetal Mortality Rate (excluding abortions) in Prediabetic Pregnancies.

Years before clinical onset of diabetes		Number of pregnancies		Number of stillbirths and neonatal deaths		Percentage total foetal mortality	Average age of mothers at time of pregnancy	Average age of mothers at time of pregnancy for group	S.D.
0–5	1	7	29	3	10	34·5	32·5	29·8	±5·37
	2	6		2			26·3		
	3	5		2			31·6		
	4	3		2			28·0		
	5	8		1			30·4		
6–10	6	4	17	1	4	23·5	22·3	27·0	±4·46
	7	3		0			29·0		
	8	3		2			29·3		
	9	4		0			27·8		
	10	3		1			28·3		
11–15	11	3	20	0	2	10·0	27·0	24·9	±3·98
	12	3		0			28·0		
	13	4		1			24·3		
	14	7		1			23·1		
	15	3		0			24·3		
15–20			9		0	0	—	22·8	±2·8
Over 20			3		0	0	—	20·6	±1·25
Totals			78		16	20·5	—	—	

TABLE II.

Total Foetal Mortality Rates for Prediabetic Pregnancies and Pregnancies in General According to Average age of Mother at the Time of the pregnancy.

Average age of mother in 5-year periods	Number of prediabetic pregnancies	Total No. of foetal and neonatal deaths	Total foetal mortality rate (per cent)	Total foetal mortality rates for pregnancies in general (per cent) (D'Esopo and Marchetti, 1942)
Less than 19 years	4	0	0	3
20–24	28	3	10.7	2.5
25–29	24	7	29.2	3.5
30–34	15	2	13.3	4.0
35–39	6	3	50	7.0
More than 40 years	1	1	100	9.0
Totals	78	16	20.5	3.9

in Table II. The figures for the pregnancies in general are taken from a graph prepared by D'Esopo and Marchetti (1942), who investigated the foetal and neonatal deaths in 25,822 deliveries.

It is clear from the table that although the age of the mother does affect the total foetal mortality rate, it is not the main factor in the production of stillbirths and neonatal deaths in prediabetic pregnancies.

The were 48 patients who developed diabetes after the age of 45 years and who had 183 pregnancies before the onset of diabetes. The results are shown in Table III. From the table it is seen that the abortion rate is less than one would expect for pregnancies in general. This is possibly explained by the fact that many of the

TABLE III.

Results of 180 Prediabetic Pregnancies Occurring in 47 Patients who Developed Diabetes after the age of 45 years.

Result	Pregnancies occurring less than 20 years before onset of diabetes	Pregnancies occurring more than 20 years before onset of diabetes	Total
Abortions	4	11	15
Abortion rate (per cent)	10.3	7.8	8.3
Intrauterine death of viable foetus	1	0	1
Neonatal deaths	1	2	3
Total late foetal mortality rate (per cent)	5.7	1.5	2.4
Alive	33	128	16.1
Total	39	141	180

women may have forgotten some of the abortions they had had. Especially is this so since the majority of the pregnancies occurred more than 20 years ago. The total late foetal mortality is also low. This may be due to the long time-interval between the pregnancy and the onset of the diabetes or to the possible difference in the type of diabetes which women over the age of 45 years develop. The number of prediabetic pregnancies occurring less than 20 years before the onset of the diabetes is too small to allow definite conclusions to be drawn but the figures suggest that the low foetal mortality rate is associated with the time factor rather than any difference in the type of diabetes.

DISCUSSION.

The nature of the factor or factors responsible for the increased birth-weight, and the increased late foetal mortality in prediabetic pregnancies remains unknown. Presumably the primary factors are the same as those responsible for the similar results in diabetic pregnancies.

In the past it has been suggested that hyperglycaemia in the diabetic mother is responsible for the large baby. Clearly this cannot be responsible for the large infant of the prediabetic mother. Smith and Smith (1935a, 1935b, 1937 and 1940) have reported hormonal changes consisting of raised serum gonadotrophin, diminished serum oestrogens and diminished pregnandiol excretion in patients with toxaemia of late pregnancy and eclampsia and state that these changes can be demonstrated 5 or 6 weeks before any signs or symptoms of toxaemia appear. White, Titus, Joslin, and Hunt (1939) suggested that the tendency to gigantism of the foetus of the pregnant diabetic might be related to a similar abnormal hormonal picture sometimes found in these women. The non-diabetic pregnant woman with toxaemia of late pregnancy does not have the large infant characteristic of the prediabetic and diabetic mother and it is therefore doubtful whether the size of the foetus is directly related to the abnormal hormonal picture.

Experimentally large foetuses have been produced by injecting the mother animal with extract of pregnant women's serum (Snyder, 1934; Hoopes and King, 1935). The large size of the foetus in these experiments was due to the prolongation of the pregnancy by the therapy. In the prediabetic and the diabetic the duration of the pregnancy is not usually increased and cannot account for the large foetus. Young (1945) has shown that repeated injections of anterior pituitary lobe diabetogenic extracts into puppies ultimately cause

diabetes. At first excessive growth occurs without producing diabetes. Once they become full grown further injections produce diabetes. Young was unable to separate the diabetogenic factor from the growth-promoting substance in his extract, so it seems possible that in the pregnant diabetic an excess of these hormones may be responsible for the large size of the foetus and also for the hypertrophy of the islets of Langerhans so frequently seen in these infants at postmortem examination (Gordon, 1935; Gray and Feemster, 1926; and Miller, 1945b). Further, the same pituitary overactivity could be responsible for the large infants of prediabetic women and the similar changes in the pancreas of such infants which have been observed by Miller (1945b). It is possible that continued overactivity of the pituitary in these women may be responsible for the eventual appearance of the diabetes as has been mentioned by other workers.

None of the hypotheses which have been put forward to explain the high foetal and neonatal mortality-rate of the diabetic pregnancy is wholly satisfactory. Coma, diabetic or hypoglycaemic, obviously cannot account for the intrauterine death of the viable foetus of the prediabetic mother.

Toxaemia of late pregnancy in the mother with its associated hormonal changes has been suggested by Smith, Smith and Hurwitz (1944) to be the cause of the high foetal mortality. The foetal mortality from late pregnancy toxaemia in non-diabetic pregnancies is approximately only half that from late pregnancy toxaemia in diabetic pregnancies (Barns, 1941). Intrauterine death of the viable foetus in a diabetic pregnancy has been observed without the association of late pregnancy toxaemia and conversely a successful outcome of a diabetic pregnancy has occurred in spite of the presence of toxaemia (Lawrence and Oakley, 1942). It would, therefore, appear that this change in the hormonal levels in the serum is not the main factor in the high foetal mortality in diabetic pregnancies. Teel (1926) produced delay of implantation of the fertilized ovum in rats by daily injections of anterior pituitary lobe extract after mating and noted prolongation of gestation corresponding approximately with the delay of implantation. The foetuses reached maturity but invariably died *in utero*. Engle and Mermod (1928) made daily implants of anterior pituitary lobe in rats and mice, beginning at various stages of gestation. Interruption of pregnancy usually occurred with resorption or expulsion of a dead foetus, although animals in which the implantation was begun during the last third of pregnancy frequently produced normal litters born at term. This work suggests that anterior pituitary lobe secretion may be associated with intrauterine death of the foetus.

It does seem, therefore, that the anterior lobe of the pituitary may be the seat of factors which are associated with a large infant and high foetal mortality in the prediabetic and diabetic pregnancy and which may be responsible for the later development of diabetes in the prediabetic mother.

Clinically, White (1945, 1947) has obtained greatly improved results for the foetal mortality in diabetic pregnancies by using oestrogens and progesterone as replacement therapy to correct the imbalance previously mentioned above. Depression of the activity of the anterior pituitary lobe might also be a result of such therapy and the improved foetal mortality-rate might be due to suppressing the excretion of the above, suggested, lethal factor. Oestrogens alone or androgens should prove equally effective and a clinical trial with these is now proceeding. Study of Young's extract on pregnant animals might give useful information on these points,

and experiments along these lines are being carried out.

SUMMARY.

(1) In confirmation of the work of other investigators it is shown that (*a*) the birth-weight of infants born of women who subsequently develop diabetes tends to be greater than normal and (*b*) the total foetal mortality-rate in such pregnancies is higher than is usual in non-diabetic pregnancies, and that this rate increases as the onset of diabetes is approached.

(2) The abortion-rate in pregnancies before and after the onset of diabetes is not found to be significantly different from the normal.

(3) In explanation of these findings the possible role of an overfunction of the anterior pituitary lobe in both the prediabetic and diabetic stages is discussed.

We wish to express our gratitude to Professor H. P. Himsworth, Director of the Medical Unit, for permission to use the records of the diabetic clinic and for reviewing this paper; to Professor W. C. Nixon, Director of the Obstetric Unit, for permission to make use of the records of the obstetric unit and for his encouragement; and to Professor F. G. Young, Professor of Biochemistry, for his helpful criticism. To Dr. M. Hamilton we wish to record our thanks for his help with the calculations.

REFERENCES.

Allen, E. (1939): *Amer. J. Obstet. Gynec.*, **38**, 982.

Barns, H. H. F. (1941): *J. Obstet. Gynaec.*, **48**, 707.

Barns, H. H. F. (1947): *Brit. med. J.*, i, 169.

D'Esopo, D. A., and Marchetti, A. A. (1942): *Amer. J. Obstet. Gynec.*, **44**, 1.

Engle, E. T., and Mermod, C. (1928): *Amer. J. Physiol.*, **85**, 518.

Gordon, W. A. (1935): *J. Michigan med. Soc.*, **34**, 167.

Gray, S. H., and Feemster, L. C. (1926): *Arch. Path.*, **1**, 348.

Herzstein, T., and Dolger, H. (1946): *Amer. J. Obstet. Gynec.*, **51**, 420.

Hoopes, E. C., and King, J. L. (1935): *Amer. J. Physiol.*, **111**, 507.

Lawrence, R. D., and Oakley, W. (1942): *Quart. J. Med.*, **11**, 45.

Miller, H. C. (1945a): *New Engl. J. Med.*, **233**, 326.

Miller, H. C. (1945b): *Amer. J. med. Sci.*, **209**, 447.

Miller, H. C. (1946): *J. Pediat.*, **29**, 455.

Miller, H. C., Hurwitz, D., and Kuder, K. (1944): *J. Amer. med. Ass.*, **124**, 271.

Smith, G. van S., and Smith, O. W. (1935a): *Surg. Gynec. Obstet.*, **61**, 27.

Smith, G. van S., and Smith, O. W. (1935b): *Surg. Gynec. Obstet.*, **61**, 175.

Smith, G., van S., and Smith, O. W. (1937): *Amer. J. Obstet. Gynec.*, **33**, 365.

Smith, G. van S., and Smith, O. W. (1940): *Amer. J. Obstet. Gynec.*, **39**, 405.

Smith, G. van S., Smith, O. W., and Hurwitz, D. (1944): *Amer. J. med. Sci.*, **208**, 85.

Snyder, F. F. (1934): *Bull. Johns Hopk. Hosp.*, **54**, 1.

Teel, H. M. (1926): *Amer. J. Physiol.*, **79**, 170.

White, P. (1945): *J. Amer. med. Ass.*, **128**, 181.

White, P. (1947): *Pennsylvania med. J.*, **50**, 705.

White, P., Titus, R. S., Joslin, E. P. and Hunt, H. (1939): *Amer. J. med. Sci.*, **198**, 442.

Young, F. G. (1945): *Biochem. J.*, **39**, 515.

PNEUMO-PYOSALPINX

BY

R. W. KINROSS PURSER, M.R.C.S., M.R.C.O.G.,

AND

JAMES YOUNG, M.D., F.R.C.O.G.,

From the Department of Obstetrics and Gynaecology, Postgraduate School of London.

AN unusual case of acute pyosalpinx was recently encountered in this hospital. Although the symptoms and the majority of the clinical signs pointed to a right-sided tubal infection, the finding of resonance over a tumour where dullness was expected raised interesting points of diagnosis. The subsequent operative discovery of a gas-filled tumour gave rise to speculation as to the cause of this rare condition, and is the chief reason for reporting this case.

Other collections of gas in the abdomen are described occasionally. Pathological pneumoperitoneum and pneumaturia have been noted as being of the more common conditions. Early descriptions of these diseases can be found in the works of Chiari (1893) and Senator (1891).

Although it would be expected that infection with the Clostridium group of organisms might explain the presence of gas, it is usual to find that the organism which predominates is the sugar-fermenting *Bacterium coli*, as in this case.

CASE RECORD.

A nullipara, aged 32 years, was admitted to this hospital as an emergency on 17th May, 1948, complaining of severe low abdominal pain, of sudden onset, for about 24 hours.

In August 1946 she had been admitted with a 3-day's history of acute appendicitis. At operation, through a muscle-cutting incision, a retrocaecal appendix was found lying in an abscess cavity whose walls were formed by omentum, caecum and peritoneum. It was removed with difficulty. The abscess cavity was drained. Systemic penicillin was administered and recovery was uneventful. Culture of the pus produced a heavy growth of *Bact. coli*. No observations regarding the condition of the pelvic organs were recorded. She had no pelvic symptoms subsequent to operation until 24 hours before this admission.

Menarche at age of 15. Periods were regular every 28 days and lasted for 6 days; average loss; no dysmenorrhoea. There was amenorrhoea for 6 months following the appendisectomy and, since then, the cycle has been 1 or 2 days every 2 or 3 months. The last period was on 18th February, 1948.

About 24 hours before admission the woman felt sick and dizzy. She vomited once. About 1 hour later she developed lower abdominal pain, stabbing in character, which did not radiate, remained localized to the subumbilical area and increased in severity. Micturition was normal. She had no bowel movement in the previous 24 hours. She has had white, odourless vaginal discharge since appendisectomy, sometimes profuse, but in no way related to the periods; her general health had been good. Her weight had remained stationary. She had no cough. She has had occasional sexual intercourse. Examination on admission revealed: temperature 102°F.; pulse 116; respirations 22; blood-pressure, 120/80. The tongue was furred and rather dry; the teeth were carious; throat and tonsils were healthy. Respiratory, cardiovascular and central nervous systems were normal. The breasts were small and inactive.

The abdomen was distended below the umbilicus, and movement on respiration was restricted. There was exquisite tenderness and guarding of the lower abdomen, especially to the right above the pubes. This area was resonant to percussion. There was no renal tenderness. Pelvic examination revealed a cervix, firm, high up and displaced to the left. There was fullness and tenderness of the right anterior and posterior fornices but extreme tenderness prevented a satisfactory examination. The uterus was not outlined. A profuse greenish discharge, a little blood-stained, was found. The clinical picture was of an acute right pyosalpinx. The patient was treated with 200,000 units of penicillin 4-hourly, and a course of 32 g. of sulphatriad was commenced.

Blood sedimentation rate 80 mm. in 1 hour. Haemoglobin 87 per cent; white-cell count, 16,000 cells per cu. mm., 90 per cent were neutrophils. Wassermann, Kahn and the gonococcal fixation tests were all negative. Urethral, vaginal and cervical swabs produced profuse growths of *Staphylococcus albus* and *Streptococcus faecalis*. Urine obtained by catheter was sterile and did not contain albumin or sugar.

The patient's general condition quickly improved. The pain and tenderness gradually disappeared but the temperature continued to swing each night up to about 102°F. On 27th May, the white count had fallen to 11,400 cells per c.mm. and the blood sedimentation rate had risen to 90 mm. fall in 1 hour. Physical examination now revealed a cystic swelling occupying the right upper pelvis and extending to just below the umbilicus. The cyst was softer than when first seen and nearly all the tenderness had subsided. The tumour had a diameter of about 6 inches (15 cm.) and was fixed. It was resonant to percussion. This resonance was considered due to overlying bowel. The uterus could not be demarcated. There was no longer any vaginal discharge. In view of persistent pyrexia and failure of the tumour to involute, it was decided to carry out examination under anaesthesia.

On examination the findings were as before. A needle was inserted into the cyst through the posterior fornix and a quantity of thick pus was aspirated. A posterior colpotomy was carried out and a little serous fluid was obtained. On these findings it was decided to carry out a laparotomy. The abdomen was opened through a midline subumbilical incision. The omentum was found lightly adherent to a cyst which was resonant to percussion. Adhesions were separated digitally from the cyst, a normal sized uterus and bowel. The tumour, now in the main free, except for a small area superiorly which was firmly adherent to bowel, was elevated through the abdominal opening. The cyst was 6 inches (15 cm.) in diameter and contained two-thirds gas and one-third pus, the fluid level being clearly seen. As the mass was being separated from the intestine it unfortunately ruptured. The pedicle was clamped, tied and divided. The tumour was removed. There was some general venous oozing from the raw surfaces and this was controlled by application of Alginate gauze. The abdomen was closed without a drain. The patient was shocked on completion of the operation. Intravenous drip was commenced. One pint of dextrose and one pint of Group O, Rh-negative blood were given. A prophylactic injection of 24,000 units of anti-gas-gangrene serum was given. A course of 30 g. of sulphathiazole was commenced and the penicillin was continued. Recovery was satisfactory except for a sinus communicating with the peritoneal cavity and the lower end of the abdominal wound. Through this was passed, between the 10th and 16th days, quantities of Alginate gauze. This gauze is normally absorbed in 5 days but presumably sepsis prevented this. Subsequent recovery was uneventful.

Culture of the pus aspirated from the cyst showed a moderate growth of coliform bacilli, resistant to penicillin, but no *Clostridium welchii*. A swab of the pus from the discharging sinus grew lactose-fermenting coliform bacilli, *Staphylococcus albus* and *Streptococcus faecalis*. These organisms were consistent with the presence of a faecal fistula. However, microscopy of the discharge did not reveal any faecal debris. Two further investigations were carried out prior to discharge. The fasting blood sugar was 97 mg. and a glucose tolerance curve was quite within normal limits. Finally a barium series was carried out in an attempt to demonstrate any evidence of a fistula or bowel damage, but none was found.

The specimen was an ovoid, ruptured, cystic mass measuring 100 by 75 by 50 mm.; the ruptured area being the thinnest part. The cyst was formed by

FIG. 1.

Low power (×8) of the cyst wall. Note loss of lining mucosa and replacement by a thick layer of fibrinous inflammatory exudate.

R.W.K.P. & J.Y.

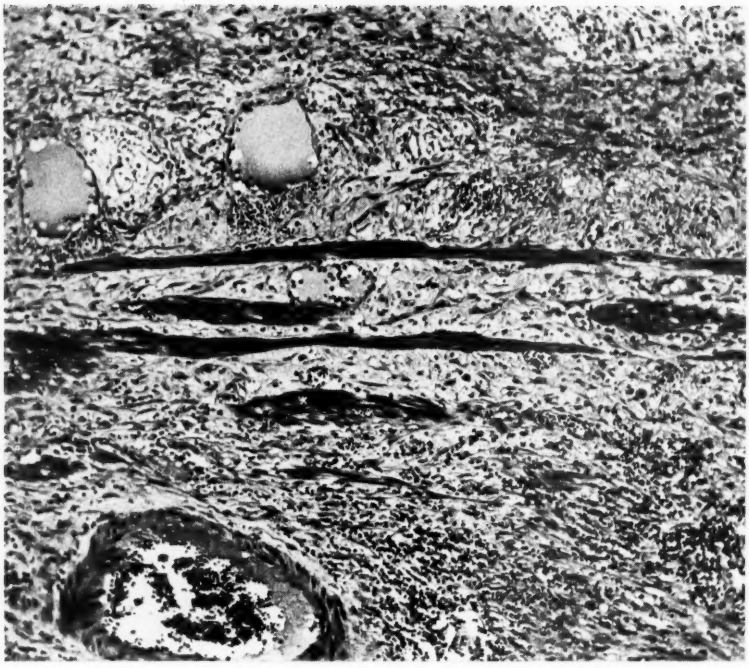


FIG. 2.

Higher power (×85) of a section of the wall to show muscle-tissue. Chronic and active inflammatory cells can be seen.

R.W.K.P. & J.Y.

the distended Fallopian tube and varied in thickness up to 15 mm. The ovary formed an hemispherical mass attached to the main cyst. The cyst was lined by a shaggy layer of fibrin. The ovary appeared to be fibrosed and contained a brown, haemorrhagic corpus luteum.

In sections of the wall of the cyst the muscular coat of the Fallopian tube was still visible (see Figs. 1 and 2) but the wall was thickened by an inflammatory exudate in which polymorphonuclears were the dominant cells. The lining epithelium had been destroyed and the cyst was lined by a mainly fibrinous inflammatory exudate. In addition to the active inflammatory exudate there was evidence of an older process in the form of a fibroblastic and angioblastic proliferation. The ovary was bound to the Fallopian tube by fibroblastic proliferation and there was some spread of the inflammatory process from the Fallopian tube into the ovary. Sections were stained for bacteria but these could not be found.

(The apparent discrepancy in the size of the tumour was considered due to shrinkage of the cyst following fixation.)

Discussion.

There seemed no doubt that the tumour was a pyosalpinx which had undergone a sudden enlargement, presumably following a reinfection and introduction of gas. It was probable that the right Fallopian tube had been involved in the infective process following the appendix abscess in 1946 and a chronic asymptomatic pyosalpinx had resulted. It was reasonable to suppose that the severity of the pain was due to a sudden distension of the cyst by gas rather than by the lighting up of the old tubal infection. It was noted prior to operation that the pain subsided coincidentally with a lessening of tension of the cyst without subsidence of the pyrexia.

The chief problem to be explained was the presence of gas in such a cyst. An extensive search of the literature does not reveal a similar occurrence. Three possibilities are open for consideration: (1) The pain may have been due to the infection and distension of the cyst by pus and this subsided as the effect of the antibiotics developed. The temperature did not fall and this, unless due to the continued use of chemotherapy, indicated a continuance of the infection. The gas may have been introduced during the procedures following the examination under anaesthesia. This was not likely, as the technique employed was such as to obviate any introduction of air. Further resonance of the tumour was demonstrated prior to operation.

(2) The gas may have been formed from an organism of the gas gangrene or lactose-fermenting coliform groups. No evidence at all was available to support the presence of the organisms of gas gangrene and cultures failed to demonstrate this type of bacteria. If such organisms were responsible for the sudden formation of gas they must be presumed to have entered from the gut or been introduced during a procedure designed to procure a miscarriage. The patient did not consider she was pregnant. Consideration of the gas-forming coliform group, however, opened up a more promising field. This was the chief organism cultured in the cyst and from the discharging wound sinus. Nevertheless, the amount of gas formed by this organism is extremely unlikely to cause sudden distension of this type of tumour. Under certain circumstances *Bact. coli* produces more gas than usual and that is in the presence of a suitable sugar medium. Several cases are recorded of perirenal and intrarenal gas formations due to this organism (Gillies and Flocks, 1941). The more common condition of pneumaturia was recognized as early as the late nineteenth century by Chiari in 1893 in association with diabetes. Riley and Bragdon (1937) had collected over 200 cases from the literature. The gas follows the decomposition of the sugar containing urine, in the bladder or renal tissues, by the *Bact. coli*. Gillies (1941) also

described cases of interstitial emphysema in diabetics suffering from *Bact. coli* infection. These cases closely resembled a true gas gangrene infection. Investigation of this patient did not reveal any diabetic tendency.

(3) Salpingo-intestinal fistula. This seemed to form the basis of a more satisfactory explanation. Occasionally a pyosalpinx may rupture into the peritoneal cavity or perforate into an adjacent viscus. Martz and Foote (1936) review the literature and found 238 cases of spontaneous rupture of a pyosalpinx. Norris in 1913 states: "rupture or perforation of an adherent pyosalpinx into the rectum is not infrequent and into the bladder or upper intestine is more rare." Tubo-vesical fistulae are described in a paper by Martin and Le Picard (1939). Croce (1947) described a case of a salpingo-colic fistula complicating a pyosalpinx. He observed that recent literature failed to reveal such a fistula above the rectum. He demonstrated his case by X-rays and at operation. Therefore even small bowel-tubal fistulae are not outside the bounds of possibility. Pneumoperitoneum is a well-recognized entity and is usually due to a valvular opening in the intestinal track from ulceration, abscess, fistula, or injury. It might be postulated, therefore, that as a result of a chronic infective process, with necrosis of the bowel wall, a small fistula developed between the intestine and the tube at the site of the densest adhesions, and that gas and organisms were able to pass through, thus producing acute distension of the fairly thin-walled cyst and reinfection by the *Bact. coli*. It can be argued in support that the organisms found in the cervical and vaginal swabs taken on admission were similar to those found in a faecal fistula. This implies drainage of the pyosalpinx, possibly as the result of increased tension, through the uterine cavity. Further, these same organisms were cultured from the pus of the discharging sinus. If this was correct the fistula might have existed after the operation, though too small to note at laparotomy, and gradually closed during early convalescence. Against this, however, is the absence of any faecal debris or intestinal cells on microscopy of the discharge from the sinus and the negative X-ray findings.

SUMMARY.

A case of pneumo-pyosalpinx has been described.

Possible causes of this unusual condition have been discussed but no definite conclusions as to the cause of the gas in the cyst have been possible on the available evidence. The main weight of evidence seems to point to a fistulous source.

We are indebted to Dr. Harrison and to Dr. Doniach for the pathological details, and to Mr. E. V. Willmot, A.R.P.S., for the photomicrographs.

REFERENCES.

Chiari, H. (1893): *Prag. med. Wschr.*, **18**, 1.

Croce, E. J. (1947): *Amer. J. Surg.*, **73**, 618.

Gillies, C. L. (1941): *J. Amer. med. Ass.*, **117**, 2242.

Gillies, C. L., and Flocks, R. (1941): *Amer. J. Roentgenol.*, **46**, 173.

Martin, R. H. and Le Picard (1939): *Bull. Soc. franç. Urol.*, 161.

Martz, H., and Foote, M. V. (1936): *Amer. J. Obstet. Gynec.*, **36**, 1009.

Norris, C. C. (1913): *Gonorrhoea in women.* Saunders, Philadelphia.

Riley, F. G., and Bragdon, F. H. (1937): *J. Amer. med. Ass.*, **108**, 1596.

Senator, H. (1891): *Int. Beitr. wiss. Med. Festschr. R. Virchow*, **3**, 317.

SPINA BIFIDA OCCULTA AND NULLIPAROUS PROLAPSE*

(With Notes on the Incidence of Certain Abnormalities of the Sacrum)

BY

ARTHUR A. GEMMELL, *M.C., T.D.*, F.R.C.O.G.,
P. H. WHITAKER, M.D., D.M.R.E.,

AND

R. L. PLACKETT, M.A.

From the Departments of Obstetrics and Gynaecology, Radiology, and Applied Mathematics (Statistics) of the University of Liverpool.

THE observations on which this paper are based were originally planned to provide an answer to the question: Is there any relation between spina bifida occulta and nulliparous prolapse? The discussion of this question forms the main part of the paper.

Further examination of the abnormalities of the sacrum which were encountered suggested that their incidence might usefully be compared with those reported by other authors because of their possible bearing on the subject of caudal anaesthesia.

Genital prolapse is a condition we are accustomed to accept as the outcome of trauma by childbirth to the structures which support the pelvic organs. The condition does, however, occur occasionally in women who have not borne children and the question then arises why the supporting structures have proved inadequate in these cases.

This is the group of cases variously called congenital or virginal or nulliparous prolapse. We prefer the term nulliparous because the condition occurs in childless women whether they are married or not and as, in these women, the prolapse is not present from birth it is not correctly described as congenital, although it may be that the cause of the failure of the supporting structure has been present from birth.

True congenital prolapse has been seen in babies a few days old. About a score of such cases have been described and were reviewed by Ballantyne (1902) and by Ebeler and Duncker (1915). In all except two of these cases the child also had a lumbosacral spina bifida which ultimately led to its death. Careful postmortem examination of the pelvic floor muscles in Ebeler and Duncker's case showed them to be very thin and heavily mixed with fat compared with those of other children of the same age.

This knowledge has led others before us to consider whether lesser defects of the posterior arches, which might possibly involve the fibres of the 4th and 5th sacral nerves, could be associated with a weak pelvic floor. Given a weak pelvic floor then the ordinary bodily stresses and strains could produce that type of hernia which we recognize as prolapse.

Such defects of development of the posterior arches are clinically referred to as

* Read at the Section of Obstetrics and Gynaecology of the Royal Society of Medicine on 19th March, 1948.

spina bifida occulta. All cases of spina bifida occulta are not accompanied by external physical signs. For instance cases have been recorded of patients suffering from defects of bladder control where a spina bifida occulta has been demonstrated only by radiography and the patients were cured by operative freeing of fibrous bands which were interfering with the nerve fibres in the area of the defect.

Ebeler and Duncker examined 28 women with prolapse by X-rays and found spina bifida occulta in 23 and no spina bifida occulta in 5. The article does not state definitely whether these were nulliparous or parous women. They also examined 28 multiparae (somewhat older) with no prolapse; only 3 of these showed spina bifida occulta.

Thaler (1916) states that, in 50 women who were proved by X-ray examination to have spina bifida occulta in the sacral region, 25 had prolapse and 25 had not. Again the parity of the patients is not stated.

Graff (1923) divides patients suffering from prolapse into 4 groups, the first 2 of which are germane to this discussion. These groups are described by him thus:

"1. Prolapse in virgins and nulliparae, often associated with growths and spina bifida.

"2. Women who develop prolapse after their first natural delivery. In these cases spina bifida occulta is often to be found. In both these groups the patients are women with particularly inferior tissues."

Heynemann (1924) investigated 20 patients suffering from prolapse by X-rays and only found 1 who showed a spina-bifida occulta. He goes on to say "the diagnosis of spina bifida occulta by X-rays can only be made when a fissure can be shown in the region of the lumbar spine (usually about L5, or in the upper portion of the sacrum). The mere presence of an enlargement of the sacral hiatus upwards to S4, 3, or near 2 is not sufficient for the diagnosis." Heynemann evidently had access to Ebeler's material for he says "Amongst his positive cases Ebeler has at least 5 and possibly 8 cases of enlarged hiatus. If these are considered his figures for positive cases are reduced to 15."

The following appears in Veit and Stoeckel's (1927) handbook. "In cases of prolapse in virginal and nulliparous women a spina bifida occulta is occasionally seen; according to Gräsner in about 10 per cent, but in these there is not complete paralysis but paresis or at least a lack of tone and capacity for contraction in the muscles of the pelvic apparatus."

Von Graff (1933) reports 26 cases of nulliparous prolapse. Only 7 of these required operative treatment as the remainder were symptomless and discovered only accidentally. He suspected spina-bifida occulta in 4 of these 7 and had them X-rayed. The findings were: 2 showed defect in 1st sacral arch; 1 showed an unusually wide foramen between the last lumbar and the 1st sacral vertebra; 1 showed a normal sacrum. He mentions 1 other woman without prolapse who showed an occult spina bifida.

Laws (1937) defines occult spina bifida as "a developmental deformity in which there is a cleft in the laminae of one or more vertebrae but no external sac."

He X-rayed 25 parous women on whom he had operated for prolapse and only 1 showed spina bifida. He also X-rayed 3 parous women who had an early recurrence after operations for procidentia and all 3 showed a spina bifida occulta. He then examined the films of 25 women X-rayed for kidney lesions; only 1 showed spina bifida occulta of the same severe degree. He concludes "if we discard minor posterior fusion defects of the first sacral arch and all varieties of sacral hiatus there will remain an incidence of at least 4 per cent

in adult women that must be considered definite cases of spina bifida occulta."

Sturmdorff (1919) is of the opinion that the majority, if not all, of the vaginal cases of prolapse are due to the existence of an unrecognized spina bifida occulta which involves the 4th sacral nerves with consequent paralysis of the levatores ani.

This rapid summary of some of the more important references to a relationship between spina bifida occulta and nulliparous prolapse does not provide us with a firm starting point for the following reasons:

(1) In most papers there is no clear indication of the parity of the patients.

(2) With the exception of Heynemann no author gives a definition of what bony defect he accepts as evidence of spina bifida occulta and as no X-ray photographs are reproduced we cannot form an opinion.

(3) The controls offered are not, in our opinion, well chosen.

In the literature dealing with variation in development of the lumbo-sacral region in apparently healthy individuals we again find difficulty in interpretation. The authors do not always indicate the source of their material in the groups they survey, or perhaps do not differentiate between males and females or state whether any steps had been taken to exclude patients with certain symptoms.

For instance Friedman, Fischer and von Demark (1946) quote various authors who give figures for the incidence of sacral spina bifida occulta varying between 5 per cent and 35 per cent, but the level at which the defects occur is not always stated.

On account of these difficulties we have selected the work of Brailsford (1934) and Trotter (1947) for comparative purposes: Brailsford, because he bases his observations on a large number of X-ray examinations and Trotter, because hers is the most recent study of a large anatomical collection.

In view of the possible variables in the papers mentioned above we have set ourselves to eliminate as many variables as possible from our material.

With the help of many colleagues all over the British Isles, to whom we express our warmest thanks, we have collected X-rays from 52 patients suffering from nulliparous prolapse and have not included in this number any patients who had, at the same time, an abdominal tumour, which, by giving rise to an increase in intra-abdominal pressure, might have been a contributory factor in the production of the prolapse.

As a control group we have X-rayed 101 healthy nulliparous women. In order to obtain some sort of a cross section of the general population we obtained our volunteers from two sources; factory workers 51, and medical students and nurses 50. All the volunteers declared themselves free of the following symptoms which might be associated with spina bifida occulta:

(1) Motor weakness in lower limbs or some segment of them.

(2) Paraesthesia, sometimes pains in corresponding zones, with loss of sensibility.

(3) Defective sphincter control; e.g., nocturnal enuresis in an adult.

(4) Abolition of tendon reflexes—loss of knee or ankle jerk.

The findings in the two groups of normal women were compared with each other. There was no statistical significance in the variations of the findings between the two groups so they have been combined to form one normal group.

The findings in the patients suffering from prolapse were then compared with this normal group. In order to facilitate comparison and to provide groups of large enough size, the number of groups was

reduced to 4; namely, non-closure of S 5; 4 and 5; 3, 4 and 5, or any other 3 segments; 2, 3, 4 and 5, and any other 4 or all 5 segments.

The actual results are shown in the accompanying table.

Non-closure of segments	Total (i.e. combined) normal group		Per cent	Nulliparous prolapse patients		Per cent
All closed	1			5		
S 5	26,	26,	25.7	10,	10,	19.2
S 4, 5	43,	43,	42.6	19,	19,	36.5
S 3, 4, 5	22			11		
S 1 with 4, 5	3,	25,	24.7		11,	21.1
S 2, 3, 4, 5	2			5		
S 1 with 3, 4, 5	2			2		
S 1 with 2, 4, 5	1					
S 1, 2, 3, 4, 5	1,	6,	5.9		7,	13.5

At first glance these figures might suggest that there is a higher proportion of defects at the caudal end of the sacrum in the normal woman and at the cephalad end in the prolapse patients, but the series of differences between these groups has been tested by the χ^2 test which gives a value of 2.83 with 3 degrees of freedom, i.e. $P=0.4$, P being the probability that these or greater differences are due to chance. As P here is considerably greater than 0.05 there is so high a degree of chance that the differences have no significance.

The individual groups which appear to give the greatest difference are those with non-closure of 4 or 5 segments in (*a*) the students and (*b*) the prolapse patients—2 in 50 students and 7 in 52 prolapse patients, but even here using Fisher's exact test (which can be used for very small numbers) $P=0.09$ and so there is no significance in the difference, especially as we have selected the group where it is greatest.

Thus the conclusion from this investigation is that in our material there is no relation between the occurrence of spina bifida occulta and that of nulliparous prolapse, where spina bifida occulta is used to mean non-closure of the posterior arches of the sacral vertebrae.

There remains one possibility which has not been examined during this investigation. It might be that the elements of the 4th and 5th sacral nerves, which supply the pelvic floor, are involved in different degree even where the defects in the sacral vertebrae have the same or similar appearances. This hypothesis could be tested by examining the muscular and sensory reactions of the structures supplied by these segments, but it seems unlikely, since 5 in 52 prolapse patients show complete closure of the dorsal wall of the sacrum and the only individual with complete absence of the dorsal wall had no prolapse.

We will turn now to some comparisons between the incidence of abnormalities recorded by Trotter and Brailsford and those found in our series.

Trotter and Letterman (1944) examined the sacra in 2 large American anatomical museums. There is no clinical history of the patients from whom the sacra were derived. The total material was 1,227 sacra, including 674 from females, of whom 234 were white women and 440 negroes. They state that the upper limit of the sacral hiatus is classically described as at the level of the lower third of the body of the 4th sacral vertebra. They find, however, that in 45 per cent of the female sacra it is at a higher level. Trotter, in a later paper (1947), gives the figure as 47 per cent for all sacra. We cannot express our findings in exactly the same way because, consequent upon variation in the position of the sacrum relative to the X-ray plate, distortion occurs. Further the exact upper limit of the hiatus is not as easy to locate in relation to a particular level on the body of a given vertebra by X-rays as it is when the bone can be handled. With these reservations we

note that the apex of the hiatus is found above the level of the body of the 4th sacral vertebra in 73 patients amongst our 101 normal women or 72.7 per cent. This figure would be expected to be lower than Trotter's but it is significantly higher.

Trotter (1947) recorded an aperture in the sacrum between the superior and inferior extremities of its dorsal wall in 25 per cent. In our series this type of abnormality is only seen 6 times in 101 normal women or in 5.9 per cent. This figure is significantly lower than Trotter's.

The only known difference between Trotter's material and ours is that hers is composed of mixed whites and negroes. It may be that the incidence of defects in whites may differ from those in negroes, i.e., that the incidence of a high apex to the hiatus is lower in negroes than in whites and that of defects in the upper segments is higher. Unfortunately Trotter does not give a separate incidence for the two races.

Trotter (1947) found complete lack of the dorsal wall of the sacrum in 0.3 per cent of 674 female sacra. We found it once in 153 women or 0.65 per cent. From our figures it is calculated that the percentage of this abnormality is likely to lie between 0 and 3.6, so the two series are compatible. Thus, whatever the factors which produce the differences found between our figures and Trotter's for the two abnormalities previously discussed, they do not apply to the rare deformity of complete lack of the dorsal wall.

Brailsford (1934) states that he found spina bifida occulta of the 1st and 2nd sacral vertebrae in 11 per cent of 3,000 spines he X-rayed. This statement is not explained by actual figures and interpretation is difficult. If it is read to mean a defect of S1 and S2 at the same time then we found only this combination in only 2 of our 153 X-rays; 1.3 per cent. $P = 0.01$ and therefore the discrepancy is real and not due to chance. If the statement is read to mean defects of S1 and S2 separately or together then in our series it is found 15 times in our 153 X-rays—this gives a percentage almost certainly between 5.6 and 15.6, so the 2 series are compatible. In each case we have excluded our 1 patient with complete absence of the dorsal sacral wall. If the former reading is correct Brailsford's higher incidence might be due to the inclusion of males or of patients who were suffering from symptoms referable to the spina bifida.

This examination of the present knowledge of the incidence of sacral deformities shows that our information is incomplete. It emphasizes the necessity for the fullest description of the material examined and for the elimination of as many variables as possible. Only when accurate knowledge is available of the incidence of symptomless bony abnormalities in healthy individuals will a proper assessment of their role in the cause of symptoms become possible.

References.

Ballantyne, J. W. (1902): *Antenatal pathology and hygiene—the foetus.* Green. Edinburgh, p. 384.

Brailsford, J. F. (1934): *Radiology of bones and joints.* Churchill. London, p. 269.

Ebeler, F., and Duncker, F. (1915): *Z. Geburtsh. Gynäk.*, **77**, 1.

Friedman, M. M., Fischer, F. J., and Von Demark, R. E. (1946): *Amer. J. Roentgenol.*, **55**, 292.

Graff, (1923): *Arch. Gynäk.*, **120**, 59.

Heynemann, T. (1924): *Zbl. Gynäk.*, **48**, 62.

Laws, G. M. (1937): *Amer. J. Obstet. Gynec.*, **33**, 126.

Sturmdorff, A., (1919): *Gynoplastic technology.* Davies. Philadelphia, p. 107.

Thaler, H. (1916): *Wien. klin. Wschr.*, **29**, 1121.

Trotter, M. (1947): *Anesth. and Analg.*, **26**, 192.

Trotter, M., and Letterman, G. S. (1944): *Surg. Gynec. Obstet.*, **78**, 419.

Veit, J., and Stoeckel, W. (1927): *Handbuch der Gynäkologie*, 3rd ed. **3**, p. 647.

Von Graff, E. (1933): *Amer. J. Obstet. Gynec.*, **25**, 800.

ERYTHROCYTE SEDIMENTATION VELOCITY (B.S.R.) IN NORMAL PREGNANCY

BY

E. OBERMER, M.D., M.R.C.S., L.R.C.P.

THAT the velocity of erythrocyte sedimentation is increased during normal pregnancy has been known ever since Fahraeus (1921) first wrote about the subject. Knowledge is lacking, however, as to how soon in pregnancy this increase begins, the rate of such an increase during the different phases of pregnancy and as to the physiological limits of varying degrees of increase in different individuals. In standard textbooks vague statements only are made; either that the rate is increased "early in pregnancy" (Levinson and MacFate, 1943) or "from the 4th month of pregnancy onwards" (Höber, 1928).

Before we can hope to assess the value of B.S.R. determinations, either in normal or abnormal pregnancy, we should have the figures for a sufficiently large number of cases of normal pregnancy. An accurate and sensitive method should be used. Further the figures should be correlated with other blood, biochemical and clinical findings. It is also desirable that different observers should use the same method.

The present communication will be confined to a description of the method used and the presentation of figures representing 283 determinations during the pregnancy of 1 abnormal and 88 normal women. The figures have been treated so as to give the picture at 4-weekly intervals throughout pregnancy. An attempt at correlating these figures with the large number of biochemical and clinical factors concerned will be published later.

METHOD.

The technique is a modification of Balachowsky's (1925) method, first published by the writer in 1935 (Obermer and Milton) and discussed in more detail in 1943 (Obermer). The method has the following advantages:

(1) It is simple to perform, requires a minimum of blood and the simplest of apparatus.

(2) It obviates errors due to variations in temperature.

(3) The test can be carried out with equal facility and accuracy in the laboratory, consulting room and at the bedside.

(4) It involves a minimum of physical disturbances of the blood.

(5) It is more sensitive than other methods in common use and thus gives a wider range of physiological, physio-pathological and pathological variations.

Apparatus required:

(1) Francke's lancet or any other instrument for making a deep prick in the pulp of the finger.

(2) Lengths of capillary tubing—10.4 cm. by 2 mm. bore.

(3) Plasticine.

(4) Thick-walled test tube—at least 15 cm. long and not less than 12 mm. in diameter.

(5) Pocket ruler, in metal or celluloid, 10 cm. long, graduated in millimetres.

(6) Leather fountain-pen holder with

safety pin to attach to waistcoat pocket to hold test tube. (When the test is to be carried out in a laboratory equipped with 37°C. incubator the test tube and holder can be dispensed with.)

(7) Small bottle of saturated solution of sodium oxalate.

Procedure. It is important that the capillary tubes, the test tube, oxalate solution and plasticine, should be kept at body temperature. They should therefore be kept in an incubator or carried in the waistcoat pocket.

The patient's hand should be immersed in very hot water, long enough to turn it lobster-red. While the patient is warming the hand a capillary tube is dipped in the oxalate solution, and allowed to fill by capillary attraction. It is then laid on a bench or bedside table, together with a ball of plasticine about 10 mm. in diameter. The patient is told to dry the hand and place it in the supine position on a towel.

A deep prick is then made in the pulp of the finger. Most of the oxalate is shaken out of the tube, leaving a column at the bottom end, of exactly 4 mm. (measured by ruler). The finger is gently squeezed with the left hand, so that a large drop of blood wells out of the pulp. The oxalated end of the capillary tube is dipped into the blood at an angle of about 60 degrees. The blood will then flow up, partly mixing with and partly pushing the oxalate in front of it. When the column of blood has been pushed halfway up, the capillary tube should be reversed, the column of blood run to the other end, and this end inserted into the drop of blood until the whole length of the tube is filled.

The tube is then placed vertically in the incubator, or dropped into the test tube in the waistcoat pocket. Readings of the supernatant plasma are taken at the end of 15, 30 and 60 minutes.

Normal limits. The upper limits of normality by this method are:

15 minutes, up to 0.4 cm. (4 mm.)
30 minutes, up to 1.0 cm. (10 mm.)
60 minutes, up to 2.5 cm. (25 mm.)

When red-blood-cell figures are available no correction need be made, unless the count is below 4 millions or over 5½ millions. Above or below these limits, the reading should be multiplied by the factor

$$\frac{\text{R.B.C. in millions}}{5}.$$

Findings in Normal Pregnancy.

Of the 88 women observed (ages 20–35) 59 were primiparae and 29 were multiparae. Early postnatal determinations were carried out in 4 cases only. The mean figures are given below in Table I.

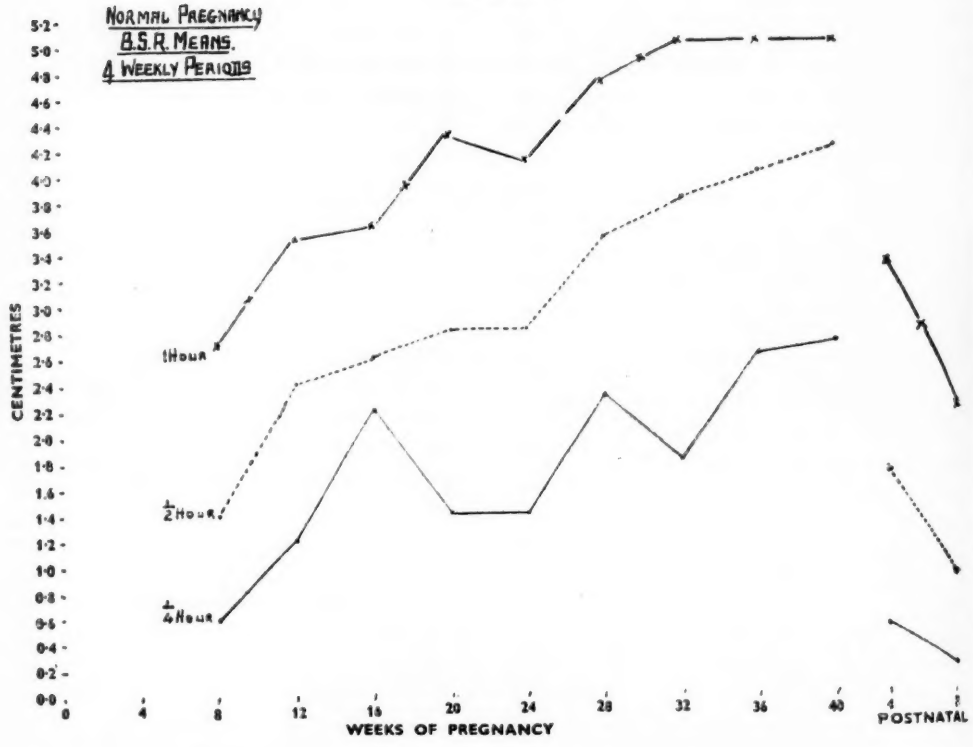
TABLE I.
B.S.R. in Normal Pregnancy.
(4-weekly periods)
(Readings expressed in centimetres)

Weeks of pregnancy	Number of investigations	Mean reading at ¼ hour	½ hour	1 hour
4–8	13	0.6	1.4	2.7
9–12	26	1.2	2.4	3.5
13–16	36	2.2	2.6	3.6
17–20	31	1.4	2.8	4.3
21–24	37	1.4	2.8	4.1
25–28	37	2.3	3.5	4.7
29–32	26	1.8	3.8	5.0
33–36	39	2.6	4.0	5.0
37–40	24	2.7	4.2	5.0
	Postnatal			
1–4	4	0.5	1.7	3.3
4–8	4	0.2	0.9	2.2

In this series no determinations were made before the 5th week. The figures given in the table under "4–8" were calculated from determinations carried out from the 5th to the 8th weeks. The majority of such readings already showed a slightly increased sedimentation velocity from the 5th week onwards.

These figures are best presented and discussed in graphic form:

GRAPH I.



The lines representing ½- and 1-hour readings show a regular, almost rectilinear, progression. After the 16th week the line representing ¼-hour readings is irregular. This is probably due to the increase of fibrin in the blood, at this period of pregnancy. Hence one or two tiny strands of fibrin may form during the first few minutes of the test. They attach themselves to the wall of the capillary tube and suffice to prevent sedimentation during the first 15 to 20 minutes. Before 30 minutes have elapsed these strands break and the ½- and 1-hour readings are unaffected. This phenomenon occurs in a relatively small proportion of cases (about 10 per cent) but may be sufficient to account for the irregularity of the ¼-hour line on the above graph.

Red-blood-cell factor.

The figures given in Table I have not been corrected for the erythrocyte count. In accordance with other observers (Wintrobe and Landsberg, 1935; Walton, 1933), the writer (Obermer, 1943) does not consider it necessary to correct for the R.B.C. count when the figures are below 4 or above 5 million. The mean R.B.C. figures for this series of cases are shown in Table II.

Physiological Variations.

There was relatively little scatter from the mean of this series, as given in Table I. There was a small percentage (less than 2 per cent) which manifested unusually slow or rapid rates. This occurs also in men and non-pregnant women, both in health and

TABLE II.
Normal Pregnancy.
Mean Erythrocyte Count.

F.W.P.	4–8	9–12	13–16	17–20	21–24	25–28	29–32	33–36	37–40	Postnatal 0–4	Postnatal 5–8
R.B.C.	4.6	4.5	4.5	4.2	4.4	4.3	4.1	4.3	4.1	4.4	4.8

R.B.C. = R.B.C. expressed in millions.
F.W.P. = Four-weekly periods.

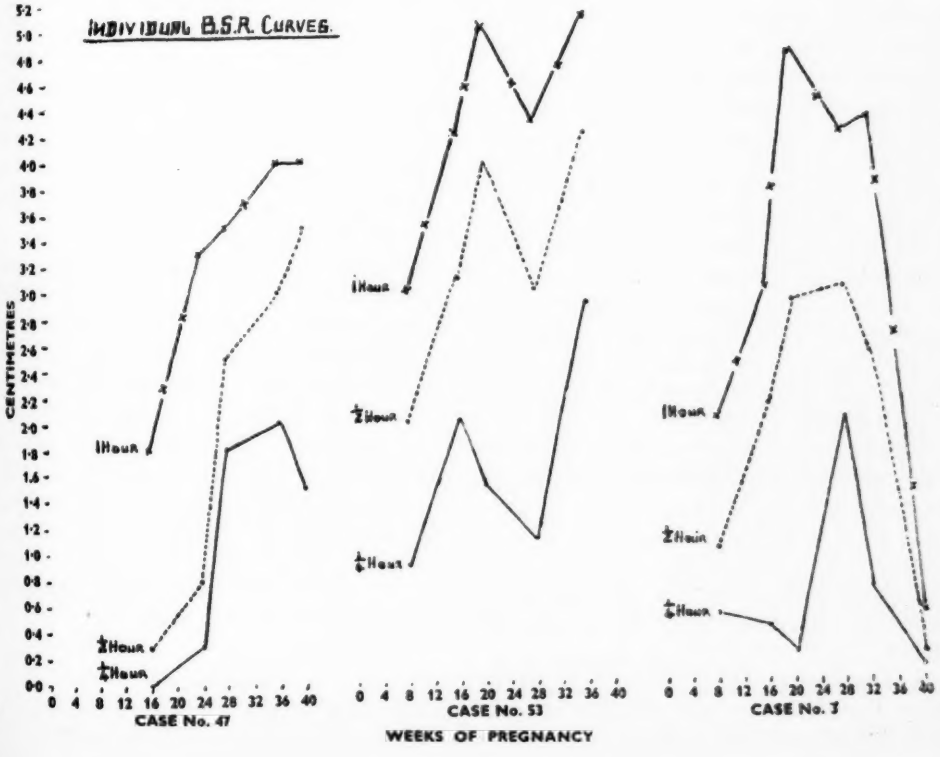
disease. These findings at both ends of a curve of frequency distribution represent an interesting problem which cannot be solved until we possess more facts as to the correlation of B.S.R. with the other factors involved—both clinical and biochemical.

The first 2 graphs below provide a quantitative illustration of the degree of variation within physiological limits—case 47 slower than the average, case 53 more rapid than the average.

Some clinical and biochemical details of these 2 cases (Nos. 47 and 53) have been published in a previous paper (Obermer, 1947a).

In case 47 the rate remained well within

GRAPH II.



the normal limits, for the non-pregnant state, up to the 25th week. The maximum rise at the end of pregnancy is also below the average. The general shape of the curves, however, was similar to that of the mean curves for the whole series—Graph I.

In case 53 the general shape of the curves is also similar. The increase of the velocity at the 8th week is, in this case, as great as the mean rise for the series at the 12th week, and reaches a maximum at the 20th week, slightly above the mean rise for the 40th week.

A Case of Intrauterine Death.

The curves of another case (case No. 3, details published elsewhere) (Obermer, 1946, 1947b) have been included in Graph II to show the possible practical utility of routine B.S.R. determinations throughout pregnancy.

The curves of this case have a shape similar to the mean curves (Graph I) up to the 32nd week—though the last two points of these curves are plotted out as representing readings at the 32nd and 40th weeks; these last 2 readings were, in fact, taken at the 31st and 37th weeks. The readings at the 37th week (plotted on the curves as if read at the 40th week) show a steep fall—practically to the normal level for the non-pregnant state. At this time the woman was expecting admission to the lying-in block. The clinicians in charge of the case did not suspect anything abnormal. Later, labour had to be induced and the stillborn infant was considered to have died *in utero*—about the 34th week.

Summary.

1. A plea is made for the use of a standardized technique by different observers.

2. The desirability is stressed of correlating B.S.R. figures with all other factors, both clinical and biochemical.

3. Details of a simple and accurate micro-method are given, suitable for use at the bedside and in the laboratory. Certain advantages are claimed for this method in which the figures do not need correction for variation in internal or external temperature.

Normal limits are given for readings carried out by this method.

4. The sedimentation velocity figures, from a series of 1 abnormal and 88 normal pregnancies, are presented in tabular and graph form. Two hundred and eighty-three determinations were carried out on these women, and the figures averaged out for each 4-weekly period during pregnancy.

5. The figures show: (*a*) That in the majority of normal pregnant women sedimentation velocity increases slightly as early as the 5th or 6th week. (*b*) That from the 8th week onwards there is a regular increase in the velocity, up to a maximum at the 40th week. (*c*) That after labour the velocity falls steeply; in 4 weeks to almost normal limits and by 8 weeks to the normal limits—for the non-pregnant state.

6. Curves are given representing the upper and lower physiological limits of variation: (*a*) from a patient whose sedimentation velocity began to increase later than normal and whose rate of increase remained less than average up to term; (*b*) a patient whose sedimentation velocity increased at a greater rate than the mean.

7. Curves are also given from a case of "intrauterine" death at about the 34th week, showing a steep fall in the velocity at the 37th week (practically to the normal level for the non-pregnant state). There were no clinical grounds for suspecting any abnormality in the pregnancy.

References.

Balachowsky, S. (1925): *Ann. Méd.*, **18**, 201.
Fahraeus, R. (1921): *Acta med. scand.*, **55**, 1.

Höber, R. (1928) In *Handbuch der normalen und pathologischen Physiologie*. VI, p. 664. Springer, Berlin.

Levinson, S. A., and MacFate, R. P. (1943): *Clinical laboratory diagnosis*. Kimpton, London, p. 490.

Obermer, E. (1943): *Practitioner*, **151**, 43.

Obermer, E. (1946): *J. Obstet. Gynaec.*, **53**, 269.

Obermer, E. (1947a): *J. Obstet. Gynaec.*, **54**, 431.

Obermer, E. (1947b): *J. Obstet. Gynaec.*, **54**, 817.

Obermer, E., and Milton, R. (1935): *Individual health*, Vol. I, pp. 24 and 79. Chapman and Hall, London.

Walton, A. C. R. (1933): *Quart. J. Med.*, **11**, 79.

Wintrobe, M. M., and Landsberg, J. W. (1935): *Amer. J. med. Sci.*, **189**, 102.

PLACENTA PRAEVIA ACCRETA

BY

W. N. CHISHOLM, *M.B.E.*, M.B., F.R.C.S., D.(Obst.)R.C.O.G.
Obstetrician and Gynaecologist, County Hospital, Whiston, Lancs.

THIS is an account of a case of placenta praevia accreta and the difficulties it occasioned. Briefly, the treatment adopted was a primary Caesarean section, partial removal of the placenta, plugging of the placental site and a secondary hysterectomy some days later.

Normally, if a placenta accreta is first discovered during a Caesarean section the right course of action is clear, as Mathieu (1937) said in reporting one such case:

"Fortunate indeed is the one who finds placenta accreta at Caesarean section rather than following vaginal delivery of a baby"; but if it is praevia, and partial separation occurs before or during Caesarean section, then the management is a more difficult problem.

The following are the details of the case:

Mrs. A. L., age 35. Married 8 years, one child aged 5 years.

Past History. Her first child was born at term, on 7th December, 1942; forceps delivery at home; admitted to hospital 24th March, 1943, with a history of postpartum haemorrhage starting at the sixth week of the puerperium and continuing until admission. Under anaesthesia the uterus proved normal in size and position; a curettage removed some decidual debris which was not examined microscopically.

She was re-admitted to hospital 23rd June, 1946, with a history of "menorrhagia" for 4½ years since the birth of her last child.

Physical examination revealed nothing abnormal; the uterus was anteverted, mobile and not enlarged. No treatment was advised and she was discharged from hospital on 29th June, 1946.

Present History. The last menstrual period was on 10th June, 1946, and the expected date of confinement, 17th March, 1947. Reviewing the case now it seems likely that these dates were wrong.

On the 16th April, 1947, her private practitioner returned from holiday, and, finding she had not yet been delivered, visited her. He found the head mobile above the pelvic brim and a vaginal examination resulted in an immediate and profuse haemorrhage. An ambulance was summoned at once, and she was admitted to hospital within a very short time of this examination. On arrival her general condition was satisfactory; slight bleeding was continuing. The urine contained no abnormal constituents; there was no oedema; blood-pressure was 110/90; the uterus appeared to be enlarged to the size of a 34-weeks' pregnancy; the vertex was high and the foetal heart sounds were heard.

On vaginal examination the cervix was high and not taken up. It admitted one finger and the placenta could be felt. There was only slight bleeding. A diagnosis of central placenta praevia was made and immediate Caesarean section decided upon.

A general anaesthetic was administered, during the induction of which she vomited undigested food.

A lower uterine segment Caesarean section was performed, the incision passing through the upper margin of the placenta. A live male child was delivered and this disclosed the placenta situated over the internal os. Up to this point bleeding had been no more than average. Search for a line of cleavage between the placenta and the uterus proved unavailing. This caused very free and alarming bleeding and in the end all that safely could be done was to remove as much as possible of the placenta piecemeal. Pituitrin 0.5 ml. had been injected into the uterine muscle which contracted well, and the operation was rapidly completed. The blood loss during the whole operation was more than average. The patient was

returned to the ward in good general condition, but, at the time, it was felt that portions of the placenta might have been left in the region of the internal os.

The postpartum loss was no more than normal. During the succeeding 6 days there was a low-grade inspiration pneumonia at the left base.

Blood count on the second day: Erythrocytes 3,000,000. Haemoglobin 55 per cent.

On the 16th day of the puerperium there was a slight red blood loss. This was repeated on the 17th day. On vaginal examination the cervix was found to be still open and gentle examination caused further bleeding. She was taken to the theatre and under sodium penthothal anaesthesia a finger was inserted into the uterus and several small portions of placenta identified in the region of the internal os. Attempts to remove these caused very free bleeding. The patient's general condition did not justify any major surgery then; a firm pack was inserted into the cervical canal; a blood transfusion was commenced and was continued for the succeeding 24 hours.

Two days later, on the 19th day of the puerperium, the patient's general condition had improved. She was accordingly taken to the theatre and the pack was removed. Immediate and alarming haemorrhage again occurred. Under gas, oxygen and ether anaesthesia the abdomen was rapidly opened and a total hysterectomy performed. Blood transfusion was recommenced. Vaginal and supra-pubic drains were inserted and the abdomen closed.

On the following day intravenous therapy was discontinued, the patient having had by then 4 pints of whole blood, 3 pints of plasma and 1 pint of glucose-saline.

The patient thereafter steadily improved, the wound healed soundly, and on discharge from hospital on the 56th day her general condition was very satisfactory.

Pathological Report. The specimen shows some several cotyledons of placenta infiltrating deeply into the wall of the lower segment, so firmly attached that their removal, even in the isolated specimen, is impossible.

Microscopical Report. There is a complete absence of the decidua basalis. Nitabuch's layer is poorly defined and the villi lie mostly on the oedematous muscle layer. Though some of the villi are healthy, many are degenerate and there is well-marked thrombosis in the maternal sinuses and in the foetal villi.

Baby. Male, weight 5 pounds 12 ounces; length, 19 inches; circumference of head, 13 inches.

From birth the baby had twitchings, cyanotic attacks, and was reluctant to feed. It rarely moved its legs; no pulsation could be felt in the femoral arteries.

A coarctation of the aorta was provisionally diagnosed. The baby died on the 8th day.

Postmortem.

Heart. (*a*) Patent ductus arteriosus. (*b*) Narrowing of the aorta between this and the subclavian artery. (*c*) Patent intraventricular septum. (*d*) Narrowing of ascending and descending colon, lumen about ¼ cm., with an area of gangrene in the ileum—cause not obvious.

Discussion.

Placenta accreta has been defined as abnormal adherence, either in whole or in part, of the afterbirth to the underlying uterine wall (Kaltreider, 1945), and the characteristic pathological finding is either entire absence or deficiency of the basal decidua. Three varieties have been recognized.

1. Placenta accreta where there is no line of cleavage between the placenta and the uterine wall.

2. Placenta increta, where the villi penetrate deeply into the muscle.

3. Placenta percreta, where the villi penetrate the peritoneal covering of the uterus.

The incidence has been estimated by various authors from 1 in 1,956 cases to 1 in 20,000.

It has been said that its cause is some previous damage to the endometrium, e.g.: Manual removal of placenta, infection of the endometrium, fibroids, previous application of radium, previous Caesarean section, previous curettage, tuberculous peritonitis, therapeutic abortions. It has

also been ascribed to abnormal endocrinal conditions.

One or other of these aetiological factors, however, is present in a great number of pregnant women, and if they have, in fact, any bearing on the occurrence of placenta accreta one would expect it to occur more frequently than it does. In the present case a curettage had been performed. It may be, of course, that many minor degrees pass unrecognized under the diagnosis of adherent placenta. The fact that the patient had a secondary postpartum haemorrhage after her first labour suggests that this may have been the case. This observation fits in well with the experience that so-called adherent placenta does tend to recur.

Placenta accreta praevia is naturally still more uncommon. In the 86 cases of placenta accreta reviewed by Irving and Hertig (1937) it was praevia in 13 instances. Of these 13 patients, 8 died. I have been able to find only 3 other cases reported during the past 10 years, Wilens (1942), Shotton and Taylor (1944) and Gemmell (1947). Each of these cases survived.

Treatment.

The difficulty of a case such as the one just described is that the diagnosis cannot be made until attempts have been made to remove the placenta at the time of the section, and by this time partial separation has occurred because of the siting of the placenta on the lower segment, and, as happened in this case, the patient's condition will have deteriorated. The decision to adopt an expectant attitude, prepared to do a hysterectomy should the occasion arise, enables the patient's condition to be restored and also affords a slight chance of saving the uterus.

If a placenta accreta is situated on the upper segment there seems no doubt that the proper treatment is either an immediate hysterectomy or to leave it alone to be absorbed. In Irving and Hertig's series all the patients died when manual removal was attempted. Those who survived had an hysterectomy performed. Greenhill (1945) quotes Shumann as reporting 4 women in whom the uterus was left; all survived and 2 had further children. Gemmell's patient was treated conservatively and she had another child.

Placenta accreta situated on the lower segment is a more difficult problem, in that usually partial separation has occurred. In cases where the fixation of the placenta is so extreme, as it was in the present case, the only safe treatment is hysterectomy as soon as the patient's condition justifies it. In minor degrees it might be possible to detach the placenta—such a course would always incur the risk of a formidable blood loss.

The presence of a foetal abnormality, coarctation of the aorta, is an interesting point. One wonders how far the foetal circulation is impeded in placenta accreta with a possible secondary effect on the foetal cardiovascular circulation.

I am indebted to Mr. P. Malpas for his advice with the case and to Professor T. N. A. Jeffcoate for examining the specimen.

References.

Gemmell, A. A. (1947): *J. Obstet. Gynaec.*, **54**, 213.

Greenhill, J. P. (1945): *Yearb. Obstet. Gynec.*, 240.

Irving, F. C., and Hertig, A. T. (1937): *Surg. Gynec. Obstet.*, **64**, 178.

Kaltreider, D. F. (1945): *Bull. Sch. Med. Univ., Maryland*, **30**, 1.

Mathieu, A. (1937): *Amer. J. Obstet. Gynec.*, **33**, 498.

Shotton, D. M., and Taylor, C. W. (1944): *J. Obstet. Gynaec.*, **51**, 340.

Wilens, I. (1942): *Amer. J. Surg.*, **58**, 434.

DANIEL DOUGAL

Obituary

DANIEL DOUGAL

M.C., M.D., F.R.C.O.G.

DANIEL DOUGAL, *M.C.*, M.D., F.R.C.O.G., Professor of Obstetrics and Gynaecology in the University of Manchester, died in the Manchester Royal Infirmary on 4th June, 1948. He was born on 4th December, 1884, at Strathaven, Lanarkshire, and for a time attended the Glasgow High School, but when his father, James Dougal, M.D., left Scotland and took up a general practice in Blackburn, Lancashire, Daniel moved to the Manchester Grammar School, and, although he was ever a Scot, he spent the whole of his professional life in the University and the hospitals of Manchester, and it is with Manchester that his name will always be linked.

After taking the degree of M.B., Ch.B., he determined to specialize in midwifery and the diseases of women, and with characteristic thoroughness he set out to prepare himself for this work.

After acting as Demonstrator in Anatomy, for which he received a scholarship, he took house appointments at the Manchester Royal Infirmary and the Northern Hospital for women and children, until he moved to St. Mary's Hospital in 1909 and began an association that was to last for his lifetime. Here he spent the next four years, holding in succession all the Resident posts up to and including that of Resident Surgical Officer, and it was in this great hospital, justly celebrated for the wealth of its clinical material and the distinction of its staff, that Dougal served his apprenticeship and learnt his craft.

In 1913 he joined the North of England Obstetrical and Gynaecological Society and he published his first paper in the *British Journal of Obstetrics and Gynaecology*, the subject being "A new Form of Pelvigraph," embodying original work on internal pelvimetry for which he was awarded the M.D., with a Gold Medal, and in the following year he obtained his first honorary appointments as Gynaecological Surgeon to the Manchester Northern Hospital and pathologist to St. Mary's. Dougal was now fairly launched as a junior consultant and had already begun to reorganize the Pathological Department of St. Mary's when the first World War broke out and he was called forthwith to military duty: for after serving in the Officers' Training Corps as a student he held a commission in the Territorial Army, and he was therefore mobilized at once and sent to France. Here he served with the 52nd Field Ambulance until he was appointed to the Staff in 1917, when he became D.A.D.M.S. to the 34th Division. He made an excellent Staff Officer, albeit a little unusual in that he combined personal efficiency with altruism, and he retained this appointment until the end of the war, his services being recognized by

the award of the Military Cross, *the Croix de Guerre avec palm* and two mentions in dispatches.

On return to civilian life in 1919, Dougal was promoted to the honorary staff of St. Mary's Hospital and to the junior teaching staff of the University. He first turned his attention to the completion of the Pathological Department of St. Mary's and was largely instrumental in obtaining the appointment of a full-time technician, for he was one of the first to insist that a laboratory is an essential part of a hospital and that pathological investigation is an indispensible feature of clinical work. He began teaching in the University and in the wards and out-patient departments and took his full share of routine work in the institutions to which he was attached. He also associated himself with many extra-mural activities in Manchester and elsewhere, and there were indeed few projects of importance to obstetrics and gynaecology in which he did not take an interest and exercise some degree of control.

During the next few years he steadily increased his reputation as a hard worker, organizer, teacher and clinician, and it was therefore no surprise when he was appointed to the chair of obstetrics and gynaecology on the death of Fothergill in 1927. Dougal held his university appointment on a part-time basis, although the work absorbed much of his time, and indeed money, for until recently the chair carried an honorarium of only £25 per annum; but he realized the importance of teaching and accepted this onerous appointment knowing full well what it meant if he were to fulfil the obligations laid upon him. With very little technical assistance (although what he had was of fine quality, and no account of Dougal's professoriate would be complete without an acknowledgement of the great help given to him by Dale, his technician), and provided with limited and almost inaccessible accommodation at the top of the Medical School, Dougal organized and expanded the existing facilities for teaching and developed and enriched the museum by adding many beautifully mounted specimens, drawings and models, together with a fully documented catalogue.

For each of his formal lectures Dougal went to great pains to produce extended notes, which were available to the students and which made for them a complete textbook. These notes were fully illustrated by drawings and photographs, and they were periodically revised and brought up-to-date, and it was anticipated that ultimately they would appear in book form. Dougal never found time to carry this into effect although publication is adumbrated in his penultimate paper in the *Journal* entitled "An improved arrangement of subject matter for a Combined Textbook of Obstetrics and Gynaecology." His last piece of work for the university, which he completed just before the onset of his last illness, was to enlarge the department still further by increasing the number of the teaching and technical staff, and by providing additional space and equipment for pure research. Dougal loved teaching, and devoted himself wholeheartedly to the interests of his students, with whom he was always popular, and it is not too much to say that largely as a result of his personal efforts his department became one of the best of the university teaching centres in this country.

He was also deeply committed to his hospitals, not only to St. Mary's but also to the Manchester Royal Infirmary, where for some years he undertook all the gynaecological work single-handed, and his interest in these institutions was not limited to the treatment of patients and the teaching of students, but embraced every aspect of their work and every means for increas-

ing their efficiency. His organizing ability and gift for administration were invaluable in committee work, and he was an active and prominent member of many committees and boards of management. Of his purely professional qualities it is difficult to speak in moderation, but of one who deplored overstatement it must suffice to say that he was a fine clinician and the sort of operator that another surgeon would choose for himself, whilst his character, as much as his attainments, earned for him the abiding trust of his patients.

But if the university and his hospitals together with the growing demands of private practice made great calls upon him, Dougal nevertheless found time for many other pursuits, both professional and otherwise. He was a constant supporter of the North of England Obstetrical and Gynaecological Society and occupied all its offices from local secretary to president. He hardly ever missed a meeting and rarely failed to make some contribution to the proceedings. His industry in this respect may be judged from the fact that he presented to the society no less than 80 formal communications, consisting of papers, notes, records of cases and descriptions of specimens, and this number is exclusive of his contributions to the discussion of the papers of other members. His own papers were illustrated by drawings (some signed D.D.), photographs and lantern slides, and, when appropriate, by the projection of histological preparations upon the screen (the slide and lantern being manipulated by Dale), all of them showing careful preparation, attention to detail, and a strict regard for the truth. He was a lucid and easy speaker and although he never spoke for the sake of speaking, he could always be relied upon to fill a gap, and he was for long regarded as one of the main supports of the society.

He was a director of the *British Journal of Obstetrics and Gynaecology*, serving as a member of the editorial committee for many years—latterly as chairman, and much of his published work appeared in its pages. These papers covered a wide range of subjects in both obstetrics and gynaecology and, although they are not founded to any extent upon original research of the so-called academic type, they record the results of much clinical and pathological investigation carried out in the wards and the laboratory and reveal an active and original mind fully conversant with the methods and results of modern research. He was distinctly in advance of his time in regard to the clinical significance of pathological investigation and in its application to teaching, and although it was quite foreign to his nature to claim priority for himself in any sphere of activity, he was certainly early in the field in this country in the study of endometriosis. His interest in this subject was shown in 1937; when he was invited to visit America to deliver the Joseph Price oration and he chose for his subject "The Problem of Endometriosis."

He was elected to the Gynaecological Visiting Society of Great Britain in 1921, and with his fellow members he visited France, Germany, Norway, Sweden, Holland and other countries in Europe, and all the teaching centres in Great Britain; indeed, during the whole period of his membership he was absent from only two of its meetings—probably a unique record, even for a society in which regular attendance is an absolute condition of membership.

He was an ardent supporter of the movement which led to the formation of the Royal College of Obstetricians and Gynaecologists, a foundation Fellow of the college and sometime member of council and vice-president, and there can be no doubt that had he lived he would have been elected to the presidential chair. He was

also a Fellow of the Royal Society of Medicine, an Honorary Fellow of the Edinburgh Obstetrical Society and an Honorary Fellow of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons. For many years he was a member of the Manchester Medical Society and its president in 1947, when he delivered an address entitled: "From the Foetal Point of View". He was also a member and ex-president of the Manchester Pathological Society. He was present at all the British Congresses of Obstetrics and Gynaecology held between the two wars—taking an active part in their proceedings—and he was chosen to represent British gynaecology at the International Congress held at Amsterdam in May 1938, when he read one of the principal papers on the "Aetiology of Thrombosis and Embolism". In addition to his professorial duties in Manchester, he acted at various times as examiner to the universities of Liverpool, Wales, Sheffield and Cambridge, to the Royal College of Obstetricians and Gynaecologists, and to the Conjoint Board; mention must also be made of his work as a teacher and examiner of midwives, and for many years he was presiding examiner in Manchester for the Central Midwives Board. For such work his wide experience and personal qualities made him an ideal choice, for his kindly manner put the most nervous individuals at their ease, and he always managed to get the best out of a candidate and, one may add, out of his fellow examiners.

Inevitably Dougal was in much demand as a consultant, and he was always ready to respond to the calls made upon him by members of the medical profession on behalf of themselves and their families, and few men can have done more in this way to earn the gratitude and esteem of their colleagues. It must not be thought, however, that the whole of Dougal's time was filled with work, far from it, for he believed that leisure was essential to good work and in spite of his professional responsibilities he found time for many other activities and for much reading. Reference has already been made to his services in the first World War: after the war was over he retained his interest in the R.A.M.C. and when the second World War broke out he again threw up his civilian work to organize and command a large military hospital at Davyhulme, Manchester, where he remained as colonel-in-charge for nearly a year, with Dale, his technician, as his sergeant-major.

As a young man he was keen on golf, but his liking for this game was challenged and soon superseded by an interest in fly-fishing, which quickly developed into an ardent passion, and thereafter the pursuit of the trout occupied much of his leisure. He also took a great interest in old pewter, of which he formed a large and very choice collection, and with his usual enthusiasm he joined the Society of Pewterers, eventually becoming its president—and, incidentally, an authority on this somewhat esoteric subject. He became a member of the Fly Fishers' Club and other fishing societies, and fished chiefly in Scotland and Derbyshire. His love of angling took him many times to his native country, where he seemed so much at home among its lochs and mountains, and he was particularly attached to Invergarry, near Fort William, to which over a period of years he paid an annual visit, and where, in 1946, he achieved one of his ambitions by taking a record trout out of Loch Lochy. He was also very fond of the rivers of Derbyshire, and for a long time Rowsley was a favourite haunt. Here, with the "Peacock" as his headquarters, he practised the art of the dry fly purist and took many "rainbows" out of the Wye.

This year he insisted on going there as usual in May, although he was a very sick man and unable to walk far, much less to wade, but he overcame this difficulty by providing himself with a stool and sitting on the bank, and thus undefeated to the last, captured two brace of fish !

The St. Andrew's Society of Manchester naturally claimed his membership and he was its president for a number of years. Their annual gatherings on November 30th gave full scope for Dougal's talents and on such occasions, wearing his decorations and looking his best in highland dress, he conducted the ceremonies with a fine dignity, and excelled himself as an after-dinner speaker when introducing the guest of honour in words that revealed his dry humour and gentle wit, and above all his love of Scotland.

It was, however, in his own home and in the presence of a devoted wife who was his inseparable companion, that Dougal revealed himself most fully and disclosed those qualities of heart and mind which made up his strong and lovable personality. Here he cultivated the art of living and here he entertained his friends, and a constant succession of visitors, around a table at which all were made to feel at home.

It remains to say something, however inadequate, of the man himself. Dougal had blue eyes which looked at one with a penetrating and slightly quizzical but entirely friendly expression; he was quiet in speech, unobtrusive in manner, and unhurried in movement, but his bearing was dignified, and his whole appearance gave the impression of honesty of purpose and latent force. He had a strong and self-reliant character and was a man of complete integrity in whom everyone trusted and, although he possessed natural gifts for organization and leadership, he avoided the limelight and was singularly free from the taint of selfishness. His character is admirably expressed by his coat of arms—the crest, the head of a bull, of which he had the courage and strength, but none of the fierceness—and his motto fitted like a glove—Stand Fast—a veritable *mot juste*.

His capacity for work was immense and until his last illness, which began about two years ago, his physical strength was apparently inexhaustible in spite of the constant demands made upon it. It has been said by one of his younger colleagues who knew him intimately that Dougal had an "inherent capacity for control" and that he was the controller or "stabilizer" of many of the institutions and societies to which he belonged. This is undoubtedly true, but his direction of affairs and of men was never dictatorial, for his "capacity for control" was exercised first and foremost upon himself, and his influence upon others was wielded more by example than by precept. He was inflexible in carrying out what he considered to be his duty and unyielding upon a matter of principle, but his methods were never harsh, and certainly few men have been so generally liked. It is indeed remarkable that such a strong character should inspire so much affection as well as respect. Daniel Dougal leaves behind him a fine record of work and achievement and it may truly be said of him that he was one of the best "all rounders" of his age and generation.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS
MATERNITY MEDICAL REPORT

Report of a Committee appointed by Council in July 1946.

Adopted by Council, 22nd May, 1948.

Introduction.

Many maternity hospitals and maternity departments throughout the British Commonwealth have issued annual medical reports since Dr. Charles J. N. Longridge, in 1905, published the first report on the practice in Queen Charlotte's Maternity Hospital. The form of such reports followed the pattern set by Dr. Longridge until 1928, when a Committee of the Obstetric Section of the Royal Society of Medicine made a standard plan which has been widely adopted. In view of the application of modern developments in medical practice the time seemed to be appropriate for a review of that standard form of report, and at the request of the Obstetric Section of the Royal Society of Medicine the College appointed a committee in July 1946 with the following terms of reference:

> "To make recommendations for revising the standard form of annual maternity hospital reports, to report any changes that are immediately necessary and thereafter to report annually to Council."

The Council of the College is firmly of the opinion that the publication of a medical report is of extreme value in maintaining a high standard of practice, and would go so far as to urge *all* maternity hospitals and departments to publish an annual report. The standard form now recommended closely follows the form used in the past and if it can be widely adopted the value of the information obtained will be enhanced by the possibility of comparisons over a number of years.

The College has appointed a sub-committee to make an annual summary of all maternity hospital reports published.

Personnel of Committee.

The President, Sir William Gilliatt; the Honorary Treasurer, Mr. A. A. Gemmell; and the Honorary Secretary, Mr. G. F. Gibberd (later Mr. H. G. E. Arthure) *ex officio*. Mr. A. C. Bell, London; Mr. S. G. Clayton, London; Mr. R. M. Corbet, Preston; Mr. S. Davidson, Birmingham; Mr. J. Hewitt, Glasgow; Professor A. A. Moncrieff, London; Mr. R. Newton, Manchester; Mr. A. W. Purdie, London; Mr. L. C. Rivett, London (Chairman).

On account of the illness of the Chairman, the Committee did not meet until 17th July, 1947, when it was convened with Mr. A. C. Bell as Deputy Chairman. At that meeting Mr. A. W. Purdie was appointed Recording Secretary. On the death of Mr. Rivett, Mr. A. C. Bell was appointed Chairman. Six meetings have been held.

The Council acknowledges with gratitude the work done by the Committee, in particular by the Recording Secretary.

The Committee records with gratitude the help it has received from the Ministry of Health, the Department of Health for Scotland, the Registrar General and many Fellows and Members of the College.

Procedure.

The procedure adopted by the Committe was to review the report of the Sub-committee of the Obstetric Section of the Royal Society of Medicine, 1928.

In recommending changes or the inclusion of new matter the Committee has tried to avoid those aspects of the subject which may be of passing interest only. That the changes are not very radical is a tribute to the report of the Sub-committee of the Obstetric Section of the Royal Society of Medicine Committee (1928).

The monthly medical report book of Queen Charlotte's Maternity Hospital was used by the Committee as a basis for discussion.

When a decision of the Committee has not been unanimous the majority decision has been

accepted. In no instance has a member of the Committee disagreed to the extent of desiring the fact to be recorded.

RECOMMENDATIONS AND OBSERVATIONS.

It is recommended that the standard report (Appendix A) should be made up of two sections: (1) an obstetric section and (2) a paediatric section.

It has been frequently suggested, both inside and outside the Committee, that the tables should be kept as simple as possible. Some of the tables now recommended may appear at first sight to be needlessly detailed, but after careful consideration the Committee is of opinion that any further simplification would reduce the value of the report.

While individual hospitals are free to modify the scheme to suit local conditions and to insert such additional tables as may be found desirable, the Committee urges that the form now suggested should be adhered to as closely as possible, so that statistics from different centres may be comparable.

THE STANDARD REPORT

Comprising: Section I, The Obstetric Report.
Section II, The Paediatric Report.

The detailed plan of the report is appended (Appendix A). The report should be prefaced by an index and by a list of abbreviations that are used throughout the entire report, i.e., in Sections I and II.

THE OBSTETRIC REPORT

The report should begin with a statistical summary presenting the principal numerical facts of the work done during the period under review.

A critical survey should follow, dealing with trends, practices and special routines, e.g., the treatment of eclampsia or toxaemia: it should be constructively critical of the work carried out in the hospital and it might be an advantage to discuss any difference of practice between individual units or departments in the hospital. Because of its importance, this critical survey should be written by a member of the senior clinical staff: if it is written by a registrar it should be approved by the senior staff before publication.

A detailed report of all obstetric cases would then follow. The arrangement of the tables recommended is indicated in Appendix A. The headings of the various tables recommended, including the paediatric tables, are shown in Appendix B.

The report should end with a full report of each maternal death, either in hospital or after transfer to another hospital or unit, and a description of any case of special interest, such as severe maternal injury, ruptured uterus, inversion, etc.

Comments for guidance in compiling the report.

Instead of the terms "booked" and "emergency", the Committee recommends the use of the terms "booked" and "non-booked". It suggests adopting the following standards:

Booked. Any case for whose antenatal care the hospital has assumed responsibility, whether for delivery in the hospital or on the district.

Non-booked. All other cases.

Maturity. Unless otherwise specified maturity means maturity at delivery.

Previous pregnancies should be recorded thus:

Previous pregnancies	
Before 28 weeks	After 28 weeks

Degree of cardiac decompensation.

It is recommended that heart disease be classified as follows (New York Heart Association, 1939):

CLASS 1. Patients with cardiac disease and no limitation of physical activity. Ordinary physical activity does not cause discomfort. Patients in this class do not have symptoms of cardiac insufficiency, nor do they experience anginal pain.

CLASS 2. Patients with cardiac disease and slight limitation of physical activity. They are comfortable at rest. If ordinary physical activity is undertaken, discomfort results in the form of undue fatigue, palpitation, dyspnoea or anginal pain.

CLASS 3. Patients with cardiac disease and marked limitation of physical activity. They are comfortable at rest. Discomfort, in the form of undue fatigue, palpitation, dyspnoea or anginal pain, is caused by less than ordinary activity.

CLASS 4. Patients with cardiac disease who are unable to carry on any physical activity without discomfort. Symptoms of cardiac insufficiency or

of the anginal syndrome are present even at rest. If any physical activity is undertaken discomfort is increased.

Pre-eclampsia, essential hypertension and chronic nephritis.

It is recommended that only one table should be used, in which would be included cases of pre-eclamptic toxaemia, of hypertension and chronic nephritis. There is no objection, however, to these three groups being shown separately if preferred.

The value of the report would be enhanced if the standard adopted in making a diagnosis is indicated.

The amount of albumen should be recorded in measured units. If impossible, the words " none ", " trace ", " cloud ", " solid " should be used rather than +, ++, +++.

The degree of oedema should be recorded be means of the words " none ", " slight ", " moderate ", " severe ".

Pyelitis.

A table for this is not recommended.

Antepartum haemorrhage.

Only two tables for antepartum haemorrhage are recommended: I, Accidental haemorrhage; II, Placenta praevia.

The former table should include all cases of antepartum haemorrhage other than those proven as placenta praevia.

Placenta praevia should either be felt *per vaginam*, or seen at Caesarean section. Types 1-4 as described by Professor F. J. Browne are recommended in describing the various types.

Uncomplicated breech.

This term indicates a breech presentation where there is no other obstetric abnormality. Extension of the limbs *per se* is not regarded as an obstetric abnormality.

If the limbs are brought down, or if any special method is employed for delivering the head, the facts should be indicated in the appropriate table in the " method of delivery " column.

Complicated breech is a breech presentation where there is some other obstetric complication endangering the child, e.g., contracted pelvis, placenta praevia, twins, toxaemia or prolapse of the cord.

Multiple pregnancy.

The recorded position of the second twin should be that immediately after the birth of the first.

Labour following previous Caesarean section.

A table is recommended in view of the wide indications for which Caesarean section is performed. This table should not include elective repeat Caesarean section.

Contracted pelvis.

A table for " contracted pelvis " is recommended. There is no objection to additional tables for " trial of labour " and/or for " suspected disproportion in cases of normal pelvis."

Prolapse and presentation of the cord.

Attention is drawn to the importance of the column headed " size of os when diagnosed ".

Postpartum haemorrhage.

Where ecbolics are used in treatment the drug used, the dose employed and the route of administration should be stated.

Secondary postpartum haemorrhage.

It is recommended that the following definition be adopted:

" Secondary postpartum haemorrhage includes any appreciable haemorrhage during the puerperium after 24 hours from the completion of labour."

External version.

A small numerical table would be sufficient. Failures should be included as well as successful versions.

Induction of labour.

A table for surgical induction of labour only is recommended, but there is no objection to a table for induction of labour by drugs alone. The induction delivery interval should always be given.

Caesarean section.

Indications for Caesarean section should be clearly defined, e.g., " bad obstetric history "

might be amplified by more details such as "3 previous stillbirths".

The indication for the Caesarean section, e.g., breech, placenta praevia, heart disease, should be recorded in the table relative to the obstetric abnormality requiring the operation as well as in the Caesarean section table.

Puerperal pyrexia.

Puerperal pyrexia shall mean any febrile condition occurring in a woman within 21 days after childbirth or miscarriage in which a temperature of 100.4°F. or more has been sustained during a period of 24 hours or has recurred within the period of 21 days. (This is the existing Ministry of Health standard with wording modified.)

Further, it is recommended that for the purpose of detailed scientific records of puerperal morbidity the following rules should be observed:

(*a*) The temperature is to be taken by a half-minute thermometer placed in the mouth for at least 2 minutes.

(*b*) The temperature is to be taken at least twice daily (morning and evening), and the evening temperature should be taken within 3 hours before the time that the patient normally goes to sleep. In cases where the temperature is taken as a routine more frequently than morning and evening, the morning and evening temperatures only are to be considered in assessing "Pyrexia".

(*c*) The day of delivery is to be counted as the first day of the puerperium.

(*d*) Patients delivered before the 28th week should be tabulated separately.

(*e*) Maternal morbidity should be computed from all cases of puerperal pyrexia and all fatal cases.

THE PAEDIATRIC SECTION.

This section should include only infants born to mothers included in the obstetric section of the report.

As in the Obstetric Section, the report should open with a statistical summary.

A critical survey should follow and it should be written by the paediatrician or senior staff. If written by the registrar it should be approved by the paediatrician or senior staff.

The detailed report of the cases would follow, arranged as in Appendix B, pages 492 to 494.

The report would end with a note of cases of special interest.

APPENDIX A

Detailed plan recommended for a Standard Maternity Hospital Report, comprising:

The Obstetric Report (Section I).

The Paediatric Report (Section II).

1. Index of the entire report, i.e. Sections I and II.
2. List of abbreviations used throughout the entire report, i.e. Sections I and II.

Section I. The Obstetric Report.

3. Statistical summary.

	In-patients		Totals
	Booked	Non-booked	
Adult patients admitted			
Patients delivered in hospital			
Primiparae			
Multiparae			
Patients admitted after delivery (B.B.A.)			
Primiparae			
Multiparae			
Total patients delivered			
Abortions			
Patients transferred			
Maternal deaths			
Maternal death rate(deaths per 1,000 live and stillbirths)			
Infants born in hospital			
Infants born before admission (B.B.A.)			
Total infants born			
Infants transferred			
Stillbirths			
Stillbirth rate (stillbirths per 1,000 live and stillbirths)			
Neonatal deaths			
Neonatal death rate (per 1,000 live births)			
Other infant deaths			

	District	Totals
Total patients delivered		
Abortions		
Patients transferred		
Maternal deaths		
Maternal death rate(deaths per 1,000 live and stillbirths)		
Total infants born		
Infants transferred		
Stillbirths		
Stillbirth rate (stillbirths per 1,000 live and stillbirths)		
Neonatal deaths		
Neonatal death rate (per 1,000 live births)		
Other infant deaths		

4. Critical survey.

5. Detailed obstetric report. (The tables recommended for use in the report book are shown in Appendix B, pages 484 to 492.)

Arrangement of tables.

Table 1. Associated diseases and conditions not detailed elsewhere, e.g., anaemia, pyelitis, diabetes, phthisis, etc.
Table 2. Abortions, including hydatidiform moles.
Table 3. Hyperemesis admitted for treatment.
Table 4. Cardiac disease.
Table 5. Pre-eclampsia, essential hypertension and chronic nephritis.
Table 6. Eclampsia.
Table 7. Accidental antepartum haemorrhage.
Table 8. Placenta praevia.
Table 9. Hydramnios.
Table 10. Tumours associated with pregnancy, labour or the puerperium.
Table 11. Primary uterine inertia.
Table 12. Persistent posterior position of the occiput and transverse arrest.
Table 13. Uncomplicated breech deliveries.
Table 14. Complicated breech deliveries (excluding breech by version in labour).
Table 15. Face and brow presentations.
Table 16. Transverse and oblique lie.
Table 17. Multiple pregnancy.
Table 18. Labour following previous Caesarean section.
Table 19. Contracted pelvis.
Table 20. Failed forceps.
Table 21. Prolapse and presentation of cord.
Table 22. Postpartum haemorrhage.
Table 23. Manual removal of placenta.
Table 24. External version before labour.
Table 25. Surgical induction of labour.
Table 26. Caesarean section.
Table 27. Forceps delivery.
Table 28. Version in labour.
Table 29. Embryotomy and craniotomy.
Table 30. Puerperal pyrexia (genital infection).
Table 31. Puerperal pyrexia (extra-genital infection).

6. Details of maternal deaths.

7. Cases of special interest.

SECTION II. THE PAEDIATRIC REPORT.

8. Statistical summary.

9. Critical survey.

10. Detailed paediatric report.

Arrangement of tables.

Table 32. Stillbirths.
Table 33. Neonatal deaths.
Table 34. Premature live-born infants.
Table 35. Congenital malformations.
Table 36. Birth trauma.
Table 37. Neonatal infections.
Table 38. Other neonatal diseases.

11. Cases of special interest.

APPENDIX B

I. The Obstetric Section.

TABLE 1. **ASSOCIATED DISEASES AND CONDITIONS NOT DETAILED ELSEWHERE.**

Booked or non-booked	Reg. No.	Age	Previous Pregnancies		Disease or Condition	Treatment	Result		Remarks
			Before 28 weeks	After 28 weeks			M.	C.	

TABLE 2. **ABORTION.**
(Expulsion of products of conception before completion of the 28th week of pregnancy.)

Booked or non-booked	Reg. No.	Age	Previous Pregnancies		Maturity	If induced : indication of method	If spontaneous : cause (if known) and treatment	Result	Morbidity	Remarks
			Before 28 weeks	After 28 weeks						

TABLE 3. **HYPEREMESIS ADMITTED FOR TREATMENT.**

Booked or non-booked	Reg. No.	Age	Previous Pregnancies		Maturity on admission	Treatment	Result		Remarks
			Before 28 weeks	After 28 weeks			M.	C.	

TABLE 4. **CARDIAC DISEASE.**

Booked or non-booked	Reg. No.	Age	Previous Pregnancies		Maturity	Lesion	Degree of failure of compensation. (Class 1, 2, 3 or 4. N.Y. Heart Assoc., 1939)		Method of delivery	Result		Remarks
			Before 28 weeks	After 28 weeks			On admission	At delivery		M.	C.	

TABLE 5. **PRE-ECLAMPSIA, ESSENTIAL HYPERTENSION AND CHRONIC NEPHRITIS.**
(If considered advisable these may be classified under three separate headings.)

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity		Albuminuria		Oedema	Highest blood pressure	No. of days in hospital before labour or discharge	If labour induced state method	Method of delivery	Result		Weight of child	Remarks
			Before 28 weeks	After 28 weeks	On admission	At delivery	Maximum	On discharge						M.	C.		

TABLE 6. **ECLAMPSIA.**

Book or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Condition on admission	If in labour	FITS					URINE			Oedema	Highest blood pressure	No. of days in hospital before delivery	If induced state method	Method of delivery	Result		Remarks
			Before 28 weeks	After 28 weeks				Before admission	Ante-partum	Intra-partum	Post-partum	Total	Albumin: On admission or maximum	Albumin: On discharge	Quantity in first 24 hrs.						M.	C.	

TABLE 7. **ACCIDENTAL ANTEPARTUM HAEMORRHAGE.**

Booked or non-booked	Reg. No.	Previous pregnancies		Maturity			Condition on admission	If in labour	Cause of A.P.H. if known	Treatment	Blood transfusion	Amount of bleeding		Result		Remarks
		Before 28 weeks	After 28 weeks	At 1st haem'h'ge	On admission	At delivery						Concealed	Revealed	M.	C.	

TABLE 8. **PLACENTA PRAEVIA.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity			Condition on admission	If in labour	Type 1, 2, 3, 4	Treatment	Blood transfusion	Amount of bleeding	Result		Remarks
			Before 28 weeks	After 28 weeks	At 1st haem'h'ge	On admission	At delivery							M.	C.	

TABLE 9. **HYDRAMNIOS.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity		Treatment	Result		Remarks
			Before 28 weeks	After 28 weeks	On diagnosis	At delivery		M.	C.	

TABLE 10. **TUMOURS ASSOCIATED WITH PREGNANCY, LABOUR OR PUERPERIUM.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Nature of tumour	Treatment	Result		Remarks
			Before 28 weeks	After 28 weeks			M.	C.	

TABLE 11. **PROLONGED LABOUR.**

(Arbitrary definition being labour lasting 48 hours or more.)

Booked or non-booked	Reg. No.	Age	Maturity	Previous pregnancies		Position of foetus		Other obstetric abnormalities	Cause of delay as diagnosed	Time of rupture of membranes, i.e., hours before delivery	Duration of labour			Treatment	P.P.H.	Morbidity	Method of delivery	Weight of child	Result	
				Before 28 weeks	After 28 weeks	At onset of labour	At delivery				1st stage	2nd stage	3rd stage						M.	C.

TABLE 12. **PERSISTENT POSTERIOR POSITION OF THE OCCIPUT AND TRANSVERSE ARREST.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Position of occiput	Type of pelvis if known	Treatment	Result		Weight of child	Remarks
			Before 28 weeks	After 28 weeks					M.	C.		

TABLE 13. **UNCOMPLICATED BREECH DELIVERIES.**

(i.e., without other obstetric abnormality. Includes cases with extended limbs.)

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Legs flexed or extended	Method of delivery	Result		Weight of child	Episiotomy or tear	Remarks
			Before 28 weeks	After 28 weeks				M.	C.			

TABLE 14. **COMPLICATED BREECH DELIVERIES.**

(Excluding breech by version in labour.) This table includes breech delivery where some other obstetric complication is present, e.g., contracted pelvis, placenta praevia, twins, toxaemia, prolapsed cord.

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Obstetric complication	Treatment	Result		Weight of child	Episiotomy or tear	Remarks
			Before 28 weeks	After 28 weeks				M.	C.			

TABLE 15. **FACE AND BROW PRESENTATIONS.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Position	Treatment	Method of delivery	Result		Weight of child	Remarks (e.g., anencephaly)
			Before 28 weeks	After 28 weeks					M.	C.		

TABLE 16. **TRANSVERSE AND OBLIQUE LIE.**
(In labour).

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Obstetric complication	Size of os when diagnosed	Treatment	Result		Weight of child	Remarks
			Before 28 weeks	After 28 weeks					M.	C.		

TABLE 17. **MULTIPLE PREGNANCY.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Presentation		Method of delivery		Sex		Weight		Type if known	Result			Remarks
			Before 28 weeks	After 28 weeks		1st	2nd	1st	2nd	1st	2nd	1st	2nd		M.	1st	2nd	

TABLE 18. **LABOUR FOLLOWING PREVIOUS CAESAREAN SECTION.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Previous Caesarian Section			Method of delivery	Weight of baby	Result		Remarks
			Before 28 weeks	After 28 weeks		Indication	Weight of baby	Type of C.S.			M.	C.	
						1. 2. 3.							

TABLE 19. **CONTRACTED PELVIS.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Type of pelvis	Pelvic measurements		Management			Length of labour		Weight of child	Result		Morbidity	Remarks
			Before 28 weeks	After 28 weeks			Clinical	Radio-logical	Surgical Induction	Trial of labour	Method of delivery	1st stage	2nd stage		M.	C.		

TABLE 20. **FAILED FORCEPS.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Failed forceps		Cause of failure	Treatment and method of delivery	Weight of child	Result		Remarks
			Before 28 weeks	After 28 weeks		Before admission	After admission				M.	C.	

TABLE 21. **PROLAPSE AND PRESENTATION OF CORD.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Size of os when diagnosed	Cause of prolapse or presentation of cord	Treatment	Result		Remarks
			Before 28 weeks	After 28 weeks					M.	C.	

TABLE 22. **POSTPARTUM HAEMORRHAGE.**

(Primary P.P.H. by convention over 20 oz. and within 24 hours of delivery. Secondary P.P.H. includes any appreciable haemorrhage occurring subsequently during the puerperium.)

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Method of delivery	Duration of labour	Amount of haemorrhage			Cause or predisposing factor	Treatment. State drug, dose and route	Blood transfusion	Remarks
			Before 28 weeks	After 28 weeks				Before delivery of placenta	After delivery of placenta	Secondary P.P.H.				

TABLE 23. **MANUAL REMOVAL OF PLACENTA.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Method of delivery	Length of Labour			Indication	Amount of bleeding ozs.	Morbidity	Result to mother	Remarks
			Before 28 weeks	After 28 weeks			1st stage	2nd stage	3rd stage					

TABLE 24. **EXTERNAL VERSION BEFORE LABOUR.**
(This table may be summarized if desired.)

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity		Indication, flexed breech, extended breech, transverse lie	Position of legs confirmed by X-ray. Yes. No.	Anaesthetic, if employed	Presentation at delivery	Result		Remarks
			Before 28 weeks	After 28 weeks	At version	At delivery					M.	C.	

TABLE 25. **SURGICAL INDUCTION OF LABOUR.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Indication	Method of induction	Induction delivery interval	Method of delivery	Duration of labour		Weight of child	Result		Remarks
			Before 28 weeks	After 28 weeks						1st stage	2nd stage		M.	C.	

TABLE 26. **CAESAREAN SECTION.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Previous C.S.	Indication	Anaesthetic used	Type of operation	If sterilized	Duration of labour		Weight of child	Result		Morbidity	Remarks
			Before 28 weeks	After 28 weeks							1st stage	2nd stage		M.	C.		

TABLE 27. **FORCEPS DELIVERIES.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Indication	Duration of labour		Weight of child	Result		Remarks
			Before 28 weeks	After 28 weeks			1st stage	2nd stage		M.	C.	

TABLE 28. **VERSION IN LABOUR.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Indication	Bipolar, external or internal	Weight of child	Result		Remarks
			Before 28 weeks	After 28 weeks					M.	C.	

TABLE 29. **EMBRYOTOMY AND CRANIOTOMY.**

Booked or non-booked	Reg. No.	Age	Previous pregnancies		Maturity	Indication	Type of pelvis	Duration of labour		Type of operation	Weight of child	Result to mother	Remarks
			Before 28 weeks	After 28 weeks				1st stage	2nd stage				

TABLE 30. **PUERPERAL PYREXIA, GENITAL INFECTION.**

Booked or non-booked	Reg. No.	Age	Maturity	Method of delivery. Operation, induction, manual removal, etc.	Cause of temperature	Organisms, if known	Treatment	Result	Remarks

TABLE 31. **PUERPERAL PYREXIA, EXTRA-GENITAL INFECTION.**

Booked or non-booked	Reg. No.	Age	Maturity	Method of delivery. Operation, induction, manual removal, etc.	Cause of temperature	Organisms, if known	Treatment	Result	Remarks

6. MATERNAL DEATHS.

1. .....
.....
.....
2. .....
.....
.....
3. .....
.....
.....

7. SPECIAL CASES.

Details of special and particularly interesting cases should be given separately.

1. .....
.....
.....
2. .....
.....
.....
3. .....
.....
.....

II. Paediatric Section.

TABLE 32. **STILLBIRTHS.**

A stillborn child is defined as one born at or after the completion of the 28th week of pregnancy and which fails to breathe after birth.

Booked or non-booked	Reg. No.	Weight	Maturity of foetus	Sex	Method of delivery	Maternal factors	Foetal factors	P.M. findings (if no P.M. state " not done ")	Remarks, including cause of death

TABLE 33. **NEONATAL DEATHS.**

Deaths within 28 days either in the hospital or after transfer to another hospital but excluding those discharged healthy.

Booked or non-booked	Reg. No.	Birth weight	Maturity of foetus	Sex	Method of delivery	Maternal factors	Complications in infant	P.M. findings (if no P.M. state "not done")	Age at death	Method of feeding	Remarks, including cause of death

TABLE 34. **PREMATURE LIVE-BORN INFANTS.**
(Birth weight 5½ lbs. and under.)

Booked or non-booked	Reg. No.	Maturity	Birth weight	Sex	Cause of premature labour	Birth injury, if any	Method of feeding	Weight on discharge	Day of discharge or death	Result	Remarks

TABLE 35. **CONGENITAL MALFORMATIONS.**

Booked or non-booked	Reg. No.	Nature of Malformation	Birth weight	Sex	Result	*Intercurrent maternal diseases	Remarks

TABLE 36. **BIRTH TRAUMA.**

Booked or non-booked	Reg. No.	Maturity	Birth weight	Sex	Type of injury	Method of delivery	Cause of injury	Result	Remarks

TABLE 37. **NEONATAL INFECTIONS.**

Booked or non-booked	Reg. No.	Maturity	Birth weight	Sex	Type of infection	Source of infection	Predominant causal organism	Treatment	Result	Remarks

TABLE 38. **OTHER NEONATAL DISEASES.**

Booked or non-booked	Reg. No.	Maturity	Birth weight	Sex	Type of disease	Maternal complication	Method of delivery	Treatment	Result	Remarks

11. SPECIAL CASES

Details of special and particularly interesting cases should be given separately.

1. .....
.....
.....
2. .....
.....
.....
3. .....
.....
.....

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At the meeting of the Council held on Saturday, 22nd May, 1948, with the President, Mr. W. Gilliatt, in the Chair, it was announced that Dr. Emil Novak, Baltimore, U.S.A., has accepted an invitation to become an Honorary Fellow of the College.

Dr. Emil Novak was appointed lecturer for 1948 under a lectureship founded to cement more closely the bonds of friendship between the British Empire and the United States of America.

Professor N. W. Philpott, Montreal, was appointed William Blair Bell Memorial Lecturer for 1948.

The following were elected to Council to fill vacancies caused by retirement, statutory and otherwise:

As representatives of the Fellows:

O'Donel Thornley D. Browne, Dublin.
Malcolm Donaldson, London.
H. L. Hardy Greer, Belfast.
Hilda Nora Lloyd, Birmingham.
H. J. Drew Smythe, Bristol.
Douglas Miller, Edinburgh.
Harold Jordan Malkin, Nottingham.

As representatives of the Members:

Donald Blake Fraser, London.
Robert James Wotherspoon, Glasgow.

The following were admitted to the Fellowship of the College:

Jermyn Oscar Baker.
Sudhir Chandra Bose.
Francis Joseph Burke.
Harold Henry Caple.
William Clement.
Geoffrey Jasper St. Clair Fisher.
Israel Goldberg.
Charles John Kenneth Hamilton.
John Stewart Henry.
Ockert Stephanus Heyns.
John Howkins.
John Godfrey Hastings Ince.
Hilda Mary Lazarus.
Douglas Marshall Lindsay.
Ralph Lodge.
Donald Mackintosh Low.
John Robertson McArthur.
Kenneth Fitzgerald Mackenzie.
Presley Archer McLeod.
Robert Baikie Meiklejohn.
Jocelyn Adelaide Medway Moore.
Arthur Beynon Nash.
Ivan Young Patrick.
Susanne Jean Paterson.
Hemendra Narayan Ray.
Helen Elizabeth Rodway.
Walter Netley Searle.
George Albert Simpson.
John Ross Vant.
George Milburn White.
William Ralph Winterton.

The following were admitted to the Membership of the College:

Sylvester Campbell Anderson.
Ellsworth Cullen Bryant.
Margaret Ellen Mary Boulton.
John Montgomery Bowen.
John Campbell McClure Browne.
James Taylor Burrowes.
Richard Waywell Burslem.
Alan Waugh Chester.
John Crawford.
Leslie Albert Cruttenden.
Peter Cronshaw Denham.
John Cathcart Hamilton Dunlop.
Sidney Evans.
John Brown Fleming.
John Frederick Foulkes.
Dennis Charles Galloway.
Stanley Frederick Hans.
Betty Hargreaves.
Jason Robert Hassard.
Rosa Hertz.
John Bain Hurll.
Philip Seukaran Jaikaran.
Eileen Iris Jamieson.
Edward Wynne Jones.
Michael Maurice Kriseman.
Sylvia Lerer.
Una Gertrude Lister.
Florence Pamela Logan.
James Theodore Louw.
Samuel Douglas Loxton.
Aaron Michel Michael.
Narotamdas Vithaldan Mody.
Cecilia Mitchell Murray.
George Stuart Musgrove.
Maurice James Dewar Noble.
Khorshed Pasricha.
Ramanlal Girdharlal Patel.
Andrew Ebert Perera.
Peng Teik Por.
Robert Williamson Kinross Purser.
Theodore Francis Redman.
Otto Arnold Schmidt.
Francis Shaw.
Benjamin Henry Sheares.
Donald Moffat Sheppard.
William Robert Sloan.
Bahman Sohrabji Surti.
David Alexander Thomson.
John Granville Thurston.
May Davies Westerman.

BRITISH MEDICAL ASSOCIATION

THE KATHERINE BISHOP HARMAN PRIZE

for the encouragement of Research into the Disorders Incident to Maternity

The Council of the British Medical Association is prepared to consider an award of the KATHERINE BISHOP HARMAN PRIZE in the year 1949. The value of the Prize is £75.

The purpose of the Prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best Essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the Prize.

Any medical practitioner registered in the British Empire is eligible to compete.

Should the Council of the Association decide that no Essay submitted is of sufficient merit, the Prize will not be awarded in 1949, but will be offered again in the year next following this decision, and in this event the money value of the Prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each Essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address.

Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than 31st December, 1948.

Inquiries relative to the Prize should be addressed to the Secretary.

CHARLES HILL,
Secretary.

British Medical Association House,
Tavistock Square, London, W.C.1.
April 1948.

BOOK REVIEW

"Gynaecological and Obstetrical Anatomy." By C. F. V. Smout, M.D., M.R.C.S.; with chapters on the Histology of the Female Reproductive Tract and its Endocrine Control, by F. Jacoby, M.D. (Pp. 241, price 40s.) London: Edward Arnold and Co.

This book has changed its name. The first edition was published under the title of "The Anatomy of the Female Pelvis", and the authors state "it was always felt that this title was not altogether a happy one since it did not entirely cover the subject-matter dealt with. . . . The new title was chosen, not only because of the stress which is laid on the gynaecological and obstetrical implications of the female pelvis, but also to cover such subject-matter as the placenta and the anatomy of the foetus in its relation to childbirth."

In this new edition much has been re-written and many new illustrations added. There is no doubt that those studying for higher degrees will find this book most useful. Whether the undergraduate will use it apart from reference is problematical. The publishers are to be congratulated on the excellence of their production.

When handling a book in this class one naturally looks for information on up-to-date topics. It is suggested in two different parts of the book that there is a relation between "congenital" prolapse and spina bifida occulta. Gemmell has stated in a recent publication that he was unable to find any evidence to support this belief. Omissions noted in an otherwise comprehensive bibliography are references to the work of Moir, Allen and Morris on pelvic radiology, and Mitchell's description of the innervation of the ovary and uterine tube.

The reviewer is of the opinion that, as at present constituted, the book, while containing much excellent matter, fails to achieve the full purpose set forth in the preface. The anatomy of the ureter has been given greater consideration than in the previous edition, but the most important fact of all from the surgeon's point of view has been dismissed summarily, namely, the blood-supply of the ureter. Meigs has indicated that a factor in the prevention of ureteral fistula at radical hysterectomy is the preservation of the small vessel of supply to the ureter from the internal iliac artery just below the brim of the pelvis. The anatomy of the female urethra in relation to the "sling" operations which have recently become popular is not discussed. If the change of title of the book is to be justified such points are important. Only close association of anatomist with gynaecologist in the writing of the book will obviate these shortcomings.

REPORTS OF SOCIETIES

ROYAL SOCIETY OF MEDICINE

Section of Obstetrics and Gynaecology.

President—A. J. McNair, F.R.C.S., F.R.C.O.G.

March 19th, 1948.

The meeting was opened by Mr. A. A. Gemmell, reading a paper entitled "Spina Bifida occulta and nulliparous prolapse."*

Discussion on the Role of Vaginal Hysterectomy in Treatment of Prolapse.

Mr. A. C. Palmer: As an opener of this discussion on the place of vaginal hysterectomy in the surgical treatment of prolapse, I would ask you to regard my remarks as an expression of personal opinion. It is true that this opinion is based on experience.

Round about 1920, the idea took shape that some forms of prolapse required removal of the uterus in the attempt to rebuild the pelvic diaphragm. During the last 25 years this idea has ripened into conviction.

It is interesting that the surgical treatment of prolapse is not yet standardized, and that it lies somewhere near the frontier of gynaecological surgery. It does this, in spite of the fact that prolapse must be as old as civilization and very nearly contemporary with the first labour. It remains true that men of great experience are not yet agreed on the best methods of obtaining a stable result.

My answer to the question "What is the position of hysterectomy in the surgical treatment of prolapse?" can be summarized in 3 words: (1) Never; (2) Sometimes; and (3) Always. With regard to *Never*, this applies to the condition when prolapse is confined to the walls of the vagina; *Sometimes*, when the cervix is in the first stage of procidentia, that is to say, when it has fallen to round about the vulval level; *Always*, when the cervix is outside the vulva.

The variations in treatment depend upon what has happened to the utero-sacral ligament. If the cervix has reached the vulva by stretching and without damage to the utero-sacral ligament, hysterectomy is contra-indicated. If, on the other hand, the cervix has brought the utero-sacral ligament down to the vulva with it, so that the index finger can easily be hooked round the ligament, then I think hysterectomy is indicated. When the cervix is well outside the vulva, it must bring the utero-sacral ligament down with it, and in my opinion, is always an indication for hysterectomy. Removal of the uterus means that the utero-sacral ligaments are in fact shortened and when approximated in the midline, stabilize the vault of the vagina. In my hands, infolding the ligaments below and in front of the cervical stump, does not stabilize the vault of the vagina and too many of my cases have come back in a year or two, with the vagina again everted. After hysterectomy, only 3 out of 300 cases have returned with an enterocele and 1 with a cystocele. These were due to errors in judgment during the operation.

If my remarks appear dogmatic, I would ask you again to regard them as a personal opinion.

Mr. John Howkins: I am fully conscious of the value and efficiency of Fothergill's operation, and I am not proposing that Mayo's operation should replace this well-tested old friend, which has held the field in the hands of so many different surgeons, employing many different techniques. I would submit, however, that the keystone doctrine is open to a fallacy. The vault of the vagina and the cardinal ligaments are not rigid structures, and do not give strength in compression as an arch does.

In removing the uterus, at or near the menopause, one frequently eradicates an organ which may be causing symptoms of excessive bleeding,

* To be reproduced in full in a future issue of the Journal.

which may harbour fibroids, or even a carcinoma. The chief advantage of the operation is that when the uterus has been removed a very efficient fascial shelf can be reconstructed from the total depth of the broad ligament down to and including the utero-sacral ligament, and the chief recommendation of this shelf is that by sewing the round ligaments together, and anchoring them to the triangular ligament they form under the bladder neck a kind of Millin's sling, made of round ligament. The effect that this has upon stress incontinence is, I submit, most beneficial.

Once a surgeon is used to the operation he will find it easier to perform than Fothergill's operation. The great criticism of vaginal hysterectomy in the past has been its liability to produce a subsequent hernia of Douglas's pouch, and in this small series, in which every case has been personally examined by me, I have found one such hernia, and I operated on it at once, so that I should have a clean bill to present to this meeting. I have now altered the technique of the operation, as you will see in the film, and by very special attention to the suturing of the utero-sacral ligaments across Douglas's pouch, and I think that with improved technique and greater experience, hernia here will become uncommon.

Prolapse is a most distressing and disabling condition, limiting the social activities of the citizen. The day of pill and pessary gynaecology is passed, and I am happy to say that I have inserted no rings or Napier's pessaries, or any other contrivance in the last two years. There is no more grateful, and no more rejuvenated person than the successfully operated upon prolapse case, and there is no more pathetic spectacle than the woman who has worn a ring for 20 or 30 years, with stress incontinence, which a ring never cures, and pessary ulceration and vaginitis, not to mention the possibility of a cancer developing from the ring. Let us therefore not deny the benefit of surgery to any of these cases.

MR. V. B. GREEN-ARMYTAGE: I am of the opinion that enterocele either before or after vaginal hysterectomy is more rare than the openers have declared, but if it does exist then in order to cure it I feel that non-absorbent sutures should be used to bring together the utero-sacral ligaments. This is a matter of some importance. Stress incontinence was remarkably absent in the majority of patients after the operation that I did, for the most important step from the patient's point of view was to bring the top of the bridge made by the application of the broad ligaments up against the inferior surface of the peritoneum under the bladder, and this was done by a stitch which was attached to the subpubic angle on either side of the urethra. It is a good thing to hear that the younger members of the Society were thinking well of this operation, but of course we should all remember that the criterion of any operation is its trustworthiness, and that one must bear in mind that vaginal hysterectomy is more difficult than a Fothergill and that the neophyte must be capable of being able to deal with such complications as occur in 2 per cent of all cases. Having done more than 1,000 Ward-Mayo operations, and over 2,000 vaginal hysterectomies, I feel sure that for prolapse, vaginal hysterectomy is, in 75 per cent of patients, a better operation in women over the age of 40 than the Fothergill. The patient should be kept flat for 5 days at least, and a self-retaining catheter kept in for 2 days or more. No dressings should be applied but simple spraying with acriflavine and spirit.

The following speakers also contributed to the discussion: Mr. Wilfred Shaw, Mr. Arthur Gemmell, Mr. Leslie Williams, Professor Macafee, Mr. William Hawksworth, Mr. A. J. Wrigley, Mr. Everard Williams and Mr. C. M. Gwillim.

NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY.

A meeting of the Society was held in Manchester on 5th March, 1948, with the President (Mr. J. E. Stacey) in the Chair.

Dr. R. M. Corbet (Preston) described a case of

PREGNANCY COMPLICATED BY LARGE HYDRONEPHROSIS.

The patient, aged 36, had had one previous pregnancy which had ended in abortion at the 3rd month and when first seen on 11th October, 1946, was approximately 18 weeks pregnant. There was no history of previous ill health and she did not have any special complaints except swelling of the abdomen, which she attributed to the pregnancy. On examination she was found to have a large

cystic swelling filling the upper abdomen, lying above the uterus and rather to the left of the middle line. The urine was normal and the blood-pressure 110/70. The outline of the tumour, separate from that of the uterus, was demonstrated by radiographs and a provisional diagnosis of ovarian cyst was made. On 30th October, 1946, laparotomy was carried out by left paramedian incision and the cyst was found to be extra-peritoneal, extending from the pelvic brim to the diaphragm on the left side. The descending colon was lateral to the tumour and the transverse colon crossed it. Mr. Arnott then took over the operation, mobilized the colon, partially collapsed the cyst and then shelled it out with difficulty. The only pedicle-like structure was found at the upper pole where at least one large vein was ligated. After removal of the cyst the left kidney could not be found, the right kidney felt enlarged. There was very little bleeding, the area was re-peritonized and the abdomen closed without drainage. The patient made a good recovery without complications.

The cyst was about 9 inches in diameter and contained approximately 8 pints of fluid which unfortunately was not analyzed. Definite kidney tissue was not found in its wall, which was lined in patches by cuboidal or flattened cells with a suggestion of stratification here and there. On one side was an almost obliterated tube which might have been a ureter. The histological findings were in keeping with a diagnosis of hydronephrosis but were not conclusive. The position of the cyst and the absence of the left kidney as revealed at operation and by subsequent intravenous pyelography, however, made the diagnosis reasonably certain. Pyelography also showed the presence of a right-sided hydronephrosis.

The pregnancy continued normally and the patient remained well until the 37th week when her blood-pressure rose to 140/90. The blood urea varied from 18 to 27 mgm. per cent. In view of the rise in the blood-pressure and the possibility that renal function might deteriorate, labour was induced by artificial rupture of the membranes at the 38th week. The position of the foetus was left occipito anterior with the head still free. Labour ensued 48 hours after puncture of the membranes and lasted 14½ hours before being terminated by a low forceps delivery for delay in the second stage. Extraction was a little difficult and the baby developed cephalhaematoma which became infected, but ultimately did well.

Intravenous pyelography carried out repeatedly after delivery showed rapid diminution in size of the right hydro-ureter, until at 6 months the appearances were regarded as normal for a patient who had only one kidney.

The history of the case suggested that the left hydronephrosis developed, or at least increased considerably in size, during the pregnancy, otherwise the patient could hardly have failed to notice the tumour. Dr. Corbet concluded by making reference to the prognosis in this case should the patient conceive again in the future.

The President said that cases of this kind usually presented difficulty in diagnosis and errors were the rule rather than the exception. He asked why labour had been induced prematurely and expressed the view that this operation is carried out too frequently and for inadequate reasons. He, together with many members of the Society, referred to similar cases and also to cases in which one kidney had been removed during or before pregnancy and in which pregnancy appeared to cause the patient no harm. The general opinion was that nephrectomy was not an indication for terminating pregnancy providing renal function tests were satisfactory. Professor Claye (Leeds) commented on the position of the pedicle and Mr. Scott Russell (Manchester) pointed out that the diagnosis could have been made before operation had more attention been paid to the relationship of the transverse colon to the tumour as shown on the radiographs which Dr. Corbet demonstrated. Mr. Calvert (Stockport) mentioned a case in which a hydronephrotic kidney had been removed during pregnancy, the pregnancy not having been diagnosed. Professor Jeffcoate (Liverpool) referred to a case previously reported to the Society in which hydronephrosis developed in a pelvic kidney during pregnancy and obstructed labour on 2 occasions. The tumour, the nature of which was still not recognized, was removed at the time of the second Caesarean section and neither pedicle nor ureter were seen nor were any vessels ligatured. The patient subsequently had a normal pregnancy and confinement.

Dr. Corbet replied and agreed that in retrospect the position of the transverse colon was clearly of diagnostic significance.

Mr. John Hamilton (Liverpool) described a case of:

LARGE FIBROID UTERUS

A nulliparous woman of 55, married for 7½ years, had had very heavy periods for 7 years and these had been irregular for 4 years. She had been told 14 years earlier that she had uterine fibroids. On examination she had an abdominal tumour considerably larger than that of a full-time pregnancy, and suffered from very severe anaemia (red-blood corpuscles 1,500,000; Hb. 15 per cent). Repeated slow blood transfusions appeared to bring on further uterine haemorrhage and operation was performed when she had had 8 pints of blood and the haemoglobin level was raised to 45 per cent. Total hysterectomy with removal of both appendages was carried out, the only difficulty being the weight and size of the tumour. Four pints of blood were transfused post-operatively and the patient made a good recovery. Two months after operation she was extremely well. The uterus was enlarged by a single fibroid weighing 32 pounds and showing extreme hyaline degeneration and cystic change. The cavity of the uterus measured 13 inches.

The President said that this tumour, although large for modern times, did not compare with those treated in the past. He himself had removed an ovarian fibroma weighing 58 pounds and he recalled watching Mr. T. G. Stevens remove a uterine fibroid which weighed 78 pounds and which had to be manipulated by block and tackle and meat hooks specially assembled above the operating table.

Mr. John Hamilton (Liverpool) described a case of:

RUPTURED HORN OF A BICORNUTE UTERUS

He pointed out that this complication is comparatively rare and usually presents all the features of ruptured ectopic pregnancy with extremely severe shock. The patient, a woman of 24, had had regular but painful menstruation from the age of 12 until 28th February, 1947, after which she conceived. She had slight spotting of blood on several occasions after that date, and her doctor had examined her and had questioned the possibility of her pregnancy being complicated by a fibroid. On 11th July, 1947 (after 18 weeks' amenorrhoea), she was seized with severe pain in the left side of the abdomen and this was followed by vaginal bleeding. A state of extreme shock developed and the abdomen was distended, rigid and tender. Laparotomy was carried out as soon as could be arranged, blood transfusion being commenced simultaneously. The foetus within its sac was lying free in the peritoneal cavity which also contained a large quantity of free blood. One horn of a bicornute uterus was ruptured across its fundus. This horn was removed, the other horn, which was well developed, and both Fallopian tubes and ovaries being conserved. The patient made a rapid recovery which was complicated only by a low-grade but persistent urinary infection. A uterine cast was passed in 2 pieces during the first week after operation.

Afterwards the patient had no further dysmenorrhoea and hysterosalpingography confirmed that the remaining horn was well developed and of good shape. Mr. Hamilton concluded by asking for opinions on the outcome and management of any subsequent pregnancy and delivery. He showed the specimen of foetus, uterine horn and decidual cast.

The President said that considering that bicornute uteri are common it is surprising that rupture of one horn is not seen more often. Mr. Malkin (Nottingham) described a similar case in which he had been able to implant the Fallopian tube from the affected side into the remaining uterine horn. Mr. Newton (Manchester) said that although this complication was not very common he at one time saw 3 cases within 3 months, and in one of these a diagnosis of retroverted gravid uterus had been made before the rupture occurred. All 3 patients had previously suffered from unilateral dysmenorrhoea. Mr. Corbet (Preston) said he did not think that Caesarean section should be necessary should the patient conceive again. Mr. Hamilton replied, and said that in his case the dysmenorrhoea had been unilateral and that a communication between the cavity of the ruptured horn and the cervical canal were seen at operation.

Miss K. Liebert (Manchester) described:

A CASE OF GENERAL PERITONITIS FOLLOWING ABORTION, TREATED WITH STREPTOMYCIN.

The patient, aged 23, was admitted on 29th November, 1947, as a case of threatened abortion. She had one child 4 months old and her last menstrual period had commenced on 17th October, 1947. In 1946 she had been treated for peritonitis

and salpingitis, and laparotomy and drainage had been carried out at that time.

On admission the cervix was found dilated with products of conception protruding through it. Abortion took place spontaneously after 4 injections of oxytocin at ½-hour intervals. Since the temperature and pulse-rate were raised, treatment with sulphamezathine was commenced at once. By 2nd December the patient had all the signs of generalized peritonitis and was treated with penicillin, intravenous fluids and intestinal decompression. Her condition deteriorated and 24 hours later laparotomy was carried out. The uterus formed the centre of a pelvic abscess (*Bacillus coli* infection); there was no definite evidence of trauma but criminal abortion was suspected. By 9th December the patient was so much improved that chemotherapy was discontinued. Three days later she began to show signs suggestive of a left subphrenic abscess and intermittent pyrexia appeared again. X-ray examination did not confirm this diagnosis but showed a pleural effusion. She then had a moderate leucocytosis (white blood corpuscles 12,700) and cultures from a discharging abdominal sinus revealed a non-haemolytic streptococcus insensitive to penicillin. By 23rd December she continued to have an intermittent high temperature and to show evidence of peritonitis. Culture showed the presence of gram positive cocci and coliform bacilli, both types being sensitive to streptomycin. The wound was then irrigated twice daily with 5 ml. of 1:1,000 streptomycin solution and 300 mgm. of streptomycin was injected intramuscularly every 4 hours for 5 days. The patient rapidly improved but on 29th December the temperature rose again. A small blood transfusion was given for she was then obviously anaemic (Hb. 48 per cent) and a further 5-day course of intramuscular streptomycin was given. By 7th January the temperature was normal and remained so. The wound commenced to heal rapidly, the patient being discharged from hospital 2 weeks later.

Miss Liebert pointed out that this case demonstrated the value of working in the closest co-operation with a bacteriologist when treating mixed infections. It was then possible to decide not only the types of organisms present but also their sensitivity to various chemotherapeutic agents. They could then be eliminated one by one until a cure was obtained. Streptomycin might have an important place in the treatment of these cases in which the organisms are shown to be penicillin-resistant. The President said he had no experience of streptomycin in the treatment of this type of infection and pointed out that it was possible that many different antibiotics, prepared possibly from the organisms themselves, may become available in the future.

Sir William Fletcher Shaw (Manchester) read a Note on:

CREDÉ'S EXPRESSION OF THE PLACENTA.

He said that recent experiences had led him to wonder if views and teaching on what constituted Credé's expression had changed. He himself had been taught that it is a method of applying gentle rhythmical stimulation to a sluggish uterus in the third stage, to induce it to contract and so separate the placenta, and only when it is contracting vigorously is it to be squeezed a little harder and the placenta delivered from the vagina by pushing the uterus gently downwards in the axis of the pelvis.

This procedure is open to much abuse by being used too soon and too vigorously, and at an early stage in his career Sir William had realized that a large percentage of the cases of retained placenta are the result of an irregularly contracting uterus produced by a doctor or midwife attempting to save time by improving upon Nature, and that the severe shock which sometimes accompanies retention of the placenta seems in many cases to be due to damage from unjustifiable squeezing of the uterus. For such reasons Sir William had got the impression that in recent years teachers had been chary of advising its use. He was, therefore, surprised to find in a recent higher examination that so many candidates stated that they used this method in the conduct of the third stage, and even more at their description of how they applied it. With one exception they stated that they grasped the fundus and squeezed it as hard as they could, vigorously pushing the uterus down into the pelvis at the same time. When asked to demonstrate the method there was no doubt of the strength they meant to apply, as their faces were strained as in a rugger scrum. In support of his interpretation he then quoted a translaton of Credé's original description of the procedure (*Klinische Vortrage uber Geburtshulfe*, 1853, Pl. 1, p. 600):

"... Failing natural discharge of the placenta

. . . In numerous cases, without exception, successful expulsion of the placenta has been obtained within a quarter or half an hour after the birth of the child, by massage through the abdominal wall around the fundus and body of the uterus—gentle at first and gradually increasing in pressure, thus producing an artificially stimulated powerful contraction. When this is at its height I grasped the uterus so that the head lay in the palm of the hand and the fingers and thumb lay along the sides of the organ, exerting a gentle and outward pressure. In each case I felt the placenta slide out of the uterus from under my fingers with such an impetus that it was carried through to the very external genitals; or at least to the lowest parts of the vagina."

Sir William Fletcher Shaw concluded from this description that Credé meant gentle massage to be used, and this for the purpose only of inducing strong contraction of the uterine muscle, the final squeeze being used only to push the placenta from the lower uterine segment and the vagina. Whatever name should be applied to the vigorous method whereby the uterus is squeezed, to use a well known phrase of Lloyd George's applied to another object, "like an orange until the pips squeaked," he did not know, but it certainly should not be Credé. He went on to say that Credé was not strictly entitled to have his name associated with the technique which he did describe, because it had been published in 1767 by John Harvie who wrote:

". . . As soon as the child is committed to the care of the nurse let the accoucher apply his hand upon the belly of the woman, which is then very loose, and he will readily feel the contracting uterus; then, having placed the flat of the hand over it, let him by a light and gentle pressure bring it downwards or towards the pubes, and he will feel the uterus sensibly contracting and then feel it so reduced in size as to be certain the placenta is expelled. By this method he will seldom have anything to do afterwards but to help it through the os externum; if even so much remains undone . . ."

Sir William then reminded the meeting that the history of medicine is full of examples in which the second name rather than that of the originator is attached to various diseases and operations: Credé and Fowler to a manoeuvre and a position described respectively by Harvie and Charles White 100 years previously, Fothergill to an operation which had already been performed for over 20 years by Donald, whilst Semmelweiss is credited with the discovery 120 years later of what had been described by Charles White and which, curiously enough, had been copied and used to such good effect in Semmelweiss's own hospital by the previous professor.

The President congratulated Sir William Fletcher Shaw on bringing to the notice of the Society a subject on which there was nowadays much confusion. He himself believed that the placenta separated from the uterine wall almost immediately at the end of the second stage, but remained in close apposition, being held there partly at least by the membranes. He deplored the tendency to interfere with the physiology of the uterus in the third stage of labour and expressed the view that an "adherent placenta" was nearly always a separated placenta retained behind a constriction ring. Mr. Racker (Manchester) considered that there was room for liberal views on the physiology and management of the third stage and the rules should not be too rigid. Dr. Newton (Manchester) said that he could not recall carrying out a manual removal of the placenta without finding the placenta still adherent in one area even if it was a small area; and he put in a plea that examiners should not be too harsh on candidates in a qualifying examination who could not be expected to give a perfect description of the treatment of the third stage of labour. Mr. K. V. Bailey (Manchester) said that Credé would certainly not recognize the method which was associated with his name at the present time and, in common with nearly all the speakers he emphasized the need for not interfering with the uterus unless haemorrhage or shock developed. Professor Claye (Leeds) thanked Sir William Fletcher Shaw for bringing the historical aspect of the subject to the notice of the Society. Mr. Calvert (Stockport) said that most teachers nowadays differentiated between squeezing the fundus to separate the placenta and expression of the already separated placenta. Professor Jeffcoate (Liverpool) agreed that this was the general teaching and in order to emphasize it he had been in the habit of avoiding the use of the term "expression" when speaking of Credé's manoeuvre. He said that the translation of Credé's article might be open to different interpretations

and that there still remained some doubt as to what was Credé's technique. He asked Sir William Fletcher Shaw to re-read the translation for the benefit of members. Mr. Fitzgerald (Manchester) also taught that there was a difference between Credé's method and expression of the placenta, while Mr. N. Edwards (Derby) said that if squeezing the uterus ever separated the placenta it should, in theory, be more effective when the uterus was relaxed rather than contracted. All speakers agreed that squeezing the uterus, irrespective of whether it is proper to call it Credé's manoeuvre, is conducive to shock and is dangerous if repeated.

Sir William Fletcher Shaw replied and, as requested, read again the translation of Credé's statement.

NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY.

The fourth meeting of the Society was held in Manchester on Friday, 2nd April, 1948.

The President (Mr. J. E. Stacey) was in the Chair.

Dr. T. Redman (Manchester) described:

An Unusual Case of Outlet Dystocia

The patient, aged 31, was first seen at the 19th week of her 3rd pregnancy. At the age of 19 she had had a permanent left inguinal colostomy for "congenital incontinence of faeces," but in spite of this her 2 previous confinements had been normal. The colostomy had always worked satisfactorily but about 9 to 12 inches of the lower limb of the bowel had prolapsed through the colostomy opening. This was causing a good deal of aching discomfort and the patient also experienced an unlocalized but distressing pain when the prolapsed loop was handled.

On examination everything seemed normal from the obstetrical standpoint. The anus was represented by a very contracted orifice which would not admit a finger. Vaginal examination was not carried out during the antenatal period. Pregnancy progressed uneventfully and the patient was admitted in labour on 25th January 1948 (expected date of confinement, 2nd February, 1948). The first stage was straightforward but, after the patient had had second stage pains for one hour, and had been co-operating well, it was clear that the foetal head was not advancing. A vaginal examination was then carried out for the first time and revealed the head low and rotated into the antero-posterior diameter of the pelvis. Beneath it and preventing its descent was a hard, craggy mass, the size of a fist, lying in the hollow of the sacrum. This was presumed to be faecal material lying in the disused rectum and, under general anaesthesia, an attempt was made to push the mass up and deliver the baby with forceps. This was impossible and the operation was abandoned, although the forceps were not removed. The anus was dilated and inspissated faeces were evacuated digitally, a procedure which took 5 minutes. The delivery was then completed easily.

Four days after delivery, Mr. Wilson excised the protruding loop of colon. He detached the colon from its attachment to the abdominal wall by a circular incision round its base, drew out as much redundant bowel as he dared (bearing in mind the danger to the inferior mesenteric artery), divided the mesentery, removed the excess bowel and joined the free end to the stump on the abdominal wall.

The patient was discharged in a satisfactory condition, and breast feeding, on the 10th day.

In his comments on the case Dr. Redman pointed out the difficulty in explaining how the mass of faecal material could have collected in the lower bowel, particularly when subsequent enquiry revealed that the patient had had the lower bowel washed out immediately before her 2nd confinement in 1944. He suggested that there may have been migration of material from the upper to the lower opening of the colostomy under cover of the pad which the patient usually kept over them. He also pointed out that the omission to carry out a vaginal examination during pregnancy or during the early part of labour had resulted in late diagnosis of the obstruction to delivery.

The President commented that this unusual occurrence certainly emphasized the need for vaginal examinations and said that rectal examinations in labour, so widely taught and practised, are a relic of the old days when puerperal sepsis was rife. He decried rectal examinations in that the findings are inaccurate and often misleading and considered that vaginal examinations as carried out under present-day conditions involve little risk and should be encouraged whenever there is any doubt about the normal progress of labour. Mr.

Wigley (Chester) said that, with careful observation of the patient and abdominal examination, pelvic examinations are usually unnecessary but believed that under ordinary conditions of practice the time factor is so important that rectal examination in labour still has a place. Mr. Marshall (Liverpool) was in favour of vaginal as opposed to rectal examination and quoted cases where the latter had been responsible for gross errors in diagnosis. Mr. Bailey (Manchester) was also opposed to rectal examinations by either doctor or midwife and said that he taught that every patient should be examined vaginally during pregnancy and also during labour (immediately after rupture of the membranes) when necessary. Mr. Rickards (Manchester) pointed out that rectal examination, by pushing the septic lower vaginal wall against the cervix, also involves risk of infection.

Dr. D. C. A. Bevis (Manchester) described a case of

Ectopic Pregnancy in a Tuberculous Fallopian Tube.

The patient, aged 32, first attended complaining of sterility. She was married in 1944 and had had an operation for tubal pregnancy in 1945. Her general health seemed good. No gross abnormality was found on pelvic examination. Before arrangements for her further investigation were completed she attended again, having had slight bleeding for 3½ weeks commencing one week after a period had been expected. The bleeding had ceased and although the possibility of ectopic pregnancy was considered, an early intrauterine pregnancy seemed the more likely diagnosis. Three days later on 28th November, 1947, she had a sudden attack of severe pain in the right side associated with vomiting and faintness. On admission the pain was less severe and was intermittent; blood-pressure, 120/70; temperature, 99.0°F.; pulse 100. The breasts were secreting slightly, there was considerable tenderness in the right iliac fossa. On vaginal examination the absence of any bleeding was noted and also diffuse tenderness. White cell count: 9,000 per c.mm.; 71 per cent polymorphonuclear cells. A provisional diagnosis of pelvic peritonitis was made and treatment with penicillin and sulphamezathine was commenced. The following day the temperature was 100°F. and intermittent pyrexia continued; 5 days after admission the patient began to cough. On 5th December, 1947, she had slight vaginal bleeding and had more pain in the right iliac fossa; the spleen was then palpably enlarged and she still had a high temperature. Vaginal examination suggested the possibility of a mass high up behind the uterus. Conditions such as typhoid fever were seriously considered, but before transferring the patient to a medical ward it was decided to carry out an examination under anaesthesia. After this examination the patient collapsed, and it was evident that she had an intraperitoneal haemorrhage so, after blood transfusion, laparotomy was performed by Dr. Scott Russell. A large ectopic pregnancy was found in the ampulla of the left Fallopian tube and was lying high up behind the uterus. Left salpingectomy was carried out. The right Fallopian tube had been removed previously and there were no adhesions in the pelvis. The following day she appeared comfortable and continued to improve until 10th December, 1947, when her temperature rose to 103°F. and she complained of cough. Examination of the chest again gave negative findings. The temperature continued to swing between 98° and 101°, and on 13th December, 1947, she complained of pain in the right side of the chest. Antiphlogistine was applied with some relief but the condition remained unchanged. Two days later the liver and spleen were again just palpable and a provisional diagnosis of undulant fever was made. The abdominal wound was well healed and she was transferred to a medical ward where it was established that she was suffering from active miliary tuberculosis. She responded well to treatment with streptomycin.

The specimen removed at operation consisted of an unruptured Fallopian tube containing placental tissue and a large amount of blood clot; an embryo 15 mm. in length was found in the blood clot. Histological examination of the material showed the presence of tuberculous salpingitis with well defined giant cell systems. The plicae of the tube were grossly swollen and adherent chorionic villi were present in the lumen. Sections of the embryo showed no obvious abnormalities.

Dr. Bevis pointed out that the association of tuberculous salpingitis and tubal pregnancy is rare. Stevenson and Wharton (1939) give the first account of the condition in English, and Bland, in 1940, collected 32 cases from the literature and was able

to add a case of his own. A search of the literature from 1939 revealed a further 7 cases. In the reported cases the presence of tuberculosis was nearly always unsuspected and was only diagnosed on histological examination. Although tuberculous salpingitis is accepted as being a cause of absolute sterility, a number of the case reports indicated that the women had already been pregnant but the interval seems to have been more than 5 years. Sterility may be due to obliteration of the fimbriated end of the Fallopian tube from coalescence of the mucosal tissue or to the destruction of the primordial follicles by an associated tubercular oöphoritis (Stevenson and Wharton, 1939).

Dr. Bevis concluded that the enlargement of the liver and spleen in his case was explained by a generalized miliary spread of the disease following pregnancy. The suggestion that pregnancy is responsible for the occurrence of recrudescence of active disease in the Fallopian tube is supported in this case by the fact that no tubercles could be demonstrated in the muscular layer of the tube. The primary focus of infection is unknown, however, as the previous medical history of this case gives no indication of a pulmonary lesion.

The President commented on the frequency of tuberculous salpingitis and said that it is probably not always a cause of absolute sterility as is often supposed. He also pointed out that it is not uncommon for evidence of tuberculosis to be found during the histological examination of Fallopian tubes which showed no naked-eye changes suggestive of the disease. Professor T. N. A. Jeffcoate (Liverpool) agreed that the pathological changes in tuberculous salpingitis vary considerably and depend possibly on the method whereby the tubes become infected. In some cases the tubes present a dull-red congested and oedematous appearance without being obstructed and without being involved in adhesions. Sometimes in patients suffering from endometrial tuberculosis the Fallopian tubes can be shown to be patent by hysterosalpingography. Nevertheless he believed sterility associated with genital tuberculosis is more often due to tubal damage than to failure to ovulate. Dr. Paine (Sheffield) agreed that the Fallopian tubes sometimes have an oedematous congested appearance without any other obvious naked-eye change, but pointed out that the site of the obstruction may be in the interstitial part of the Fallopian tube only and may be overlooked.

Mr. H. B. Bagshaw (Liverpool) described a case of

Jaundice in Late Pregnancy

A woman, 37 years of age, had beeen married 5 years and had had 1 abortion. She was first seen on 18th October, 1946, at the 18th week of her 2nd pregnancy (last menstrual period: 20th June, 1946). She had had scarlet fever at the age of 3 but no other significant ill-health. Morning sickness had been present during the first 10 weeks but otherwise she had been well during the pregnancy. Examination did not reveal any abnormality; blood-pressure 115/70 mm. Hg; urine normal; Wassermann reaction, negative; uterus 18 weeks in size.

The patient paid 4 subsequent visits to the antenatal clinic the last being on 24th January, 1947, and at that time she was 32 weeks pregnant and well in every respect. Urine normal; blood-pressure 128/80. On the evening of the following day she was taken suddenly ill, the first symptom being an attack of dyspnoea. She was attended by her own doctor who apparently did not regard her condition as being serious at first and did not order any special treatment. He referred her to hospital 2 weeks later, on 9th February, 1947.

The patient stated that for 10 days prior to admission she had had considerable vomiting, and that on the day of admission the vomit had been coffee-ground, her feet and legs had been swollen for 10 days, her urine had been dark and muddy for a week, her stools had been pale for a few days and she had had epigastric pain for a day. On admission the patient looked extremely ill. There was deep jaundice of the skin and of the sclerotics. The tongue was dry as parchment and fissured. The gums were bleeding. The temperature was 98°F. The pulse-rate was 112 per minute and the respiration rate was 20 per minute. The blood-pressure was 165/105 mm.Hg. The urine contained a large amount of albumin and also bile pigment. There was an erythematous papular rash on the lower extremities and over the arms, which disappeared on pressure. There was gross pitting oedema of the lower extremities. The uterus was enlarged to the size of a 34-weeks pregnancy. Foetal parts could be felt without difficulty and the uterus was not tender. The foetal head was pre-

senting and a third of it was engaged in the pelvis. The foetal heart could not be heard. The liver was not palpable.

A provisional diagnosis of acute yellow atrophy with intrauterine death of the foetus was made and it was decided to induce labour immediately by artificial rupture of the membranes. Intravenous medication with 5 per cent dextrose in normal saline, protein hydrolysate and 10 per cent calcium gluconate was also commenced. A stillborn; not macerated male foetus, weighing 4 pounds 12½ ounces, was delivered at 6.10 a.m. the following morning. The third stage of labour was normal, but blood clot weighing 12 ounces was expressed with the placenta and membranes. Immediately after delivery the blood-pressure fell to 130/60 mm. Hg.

A few hours after delivery the patient's condition appeared desperate and 4 obstetricians who saw her all expressed the opinion that death was imminent. She was deeply jaundiced, had increased vomiting and became very drowsy with occasional muscular twitchings and attacks of hiccough. However, within 24 hours her condition began to improve, the gums ceased to bleed, the jaundice gradually faded and was not apparent after 3 weeks, the rash disappeared and the oedema subsided. The puerperium was afebrile and the patient was discharged symptom-free 1 month after admission.

Intravenous therapy was given continuously during the first 4 days after admission, and in all she received 8½ litres of 5 per cent dextrose saline and 2 litres of protein hydrolysate in 5 per cent dextrose, together with 25 units of insulin. She was also given 10 ml. of 10 per cent solution of calcium gluconate, intravenously, and 20 mgm. of Vitamin K analogue intramuscularly, daily, for the first 6 days. The diet was fat-free until the bile disappeared from the urine. In the first 24 hours her fluid intake was 81 ounces and her output (urine and vomit) was 14 ounces. In the second 24 hours the intake was 138 ounces and the output 62 ounces. In the third 24 hours the intake was 140 ounces and the output 82 ounces. In the fourth 24 hours the intake was 128 ounces and the output was more than 66 ounces. The blood-pressure never rose above 165 mm. Hg systolic and was within normal limits during the last fortnight the patient was in hospital. At first there was a large amount of albumin in the urine with red-blood corpuscles and an occasional granular cast. Albuminuria was still present when she left hospital.

A considerable number of biochemical tests were carried out and Mr. Bagshaw showed charts of the results of these. At first the blood urea and blood uric acid estimations and thymol turbidity test all gave high readings and there was much flocculation in the cephalic cholesterol test. These findings collectively indicated extensive liver damage.

The patient was seen on 4 occasions at the postnatal clinic, the last being on 26th January, 1948. She is now well and free from symptoms. Cholecystography shows a normal gall bladder. Liver function tests give normal readings. The blood urea figure remains on the high side of normal, but she has persistent slight albuminuria and slight hypertension (145/95).

Mr. Bagshaw in discussing the case said that it was difficult if not impossible to make a definite diagnosis because liver biopsy was not undertaken. Nevertheless the clinical features pointed to a severe toxaemic condition rather than to infective hepatitis, and the most likely diagnosis was obstetric acute yellow atrophy of the liver as described by Sheehan. In this condition the pathological change in the liver is sometimes reversible and the chief hope lies in intensive glucose therapy. If the diagnosis is correct in this case then treatment may have something to do with the patient's recovery.

In conclusion Mr. Bagshaw referred to the prognosis in the event of future pregnancies, pointing out that although this woman now appeared to have normal liver function, he had so far advised against pregnancy because of persisting albuminuria and hypertension, and because of poor renal function as shown by the urea clearance test.

The President congratulated Mr. Bagshaw on the successful treatment of this case and said that the result should encourage others to persist with intensive treatment even in apparently hopeless cases. Dr. S. B. Herd (Liverpool) recalled 2 similar but milder cases, in both of which the woman had recovered. Mr. C. H. Walsh (Liverpool) pointed out the value of the newer liver function tests in the study of these cases, whilst Dr. Racker (Manchester) emphasized the need for administering protein as well as glucose. Dr. Paine (Sheffield) gave an account of a similar case in which the

patient also had eclampsia. The serum protein dropped to 4.4 mgm. per cent and the patient was treated successfully by plasma transfusion and large doses of vitamin B. Mr. Liggett (Blackburn) also mentioned 2 similar cases, one in which the woman recovered and the pregnancy continued with the ultimate live birth of a premature foetus, and one in which a woman, jaundiced and comatose, ultimately recovered and that in spite of many other complications such as streptococcal infection and thrombophlebitis.

Mr. C. M. Marshall (Liverpool) reported three unusual cases which were illustrated by colour film.

The first was a spinster of 68 suffering from intra-epidermal carcinoma (Bowen's disease) of the vulva. Her sole complaint was of unpleasant irritation of the vulva for 18 months. The labia and a butterfly area some 5 cm. beyond were the site of a reddish brown and slightly raised " flush " with a well-defined and, in places, quite palpable edge. There was not vaginal involvement and the perineum was hardly affected. The labium minus was the site of a small leukoplakic patch. The surface of the affected area was dry and palpation caused shallow fissures to appear, which bled slightly. Acting on the clinical diagnosis alone the vulva was excised, and examination revealed histological findings typical of intra-epidermal carcinoma. There was no recurrence at the time of the report, 2 years after the operation.

The next was a case of delivery through the posterior vaginal fornix. The patient, aged 28 and a para-2, was first seen a few months after the delivery of her second child when she was complaining of prolapse of the uterus and profuse blood-stained vaginal discharge. Occupying the posterior fornix and the back of the cervix to within 4 cm. of the external os there was a roughly circular crater-like ulcer some 5 cm. in diameter. There was a fistulous opening in its base through which a sound could be passed into the uterus. The distal portion of the cervical canal was patent and the external os presented all the features of a nulliparous orifice. It was learned that the 2nd delivery had occurred easily. At her first confinement 2 years previously the midwife had summoned a doctor when the patient could not deliver herself, though the head was partially crowned. He incised a membrane over the head which he stated was not the foetal membrane and delivered with forceps. Mr. Marshall considered that this was a case of true rigidity of cervix and os, though it might conceivably have arisen from pregnancy and labour occurring in a retroverted uterus which had undergone anterior sacculation. The prolapse was cured by the Fothergill type of operation, the cervical amputation being high enough to include the " ulcer " and fistulous opening. The specimen was shown.

The last case illustrated an obstetric complication of vaginal fixation of the uterus during a repair operation between the 4th and the present pregnancies. The patient, 37 years of age, was admitted at term with ruptured membranes and the foetus lying transversely. Under anaesthesia a foot was easily secured and drawn through a 2-finger cervix, but it was found impossible to bring about any alteration in the lie of the foetus. It was noted at the time that a tense band could be felt arising in the anterior fornix and running upwards in the midline towards the body of the uterus. When, at the end of 20 hours, labour had not begun, the foetus had died, and the pulse rate was rising, the abdomen was opened and hysterectomy with the foetus *in situ* was carried out. On opening the abdomen the superior border of the uterus was found deeply depressed in the centre (fundus) and actually at a lower level than its lateral portions (lateral borders), thus giving the organ a bilobular appearance. The fundus was found to be anchored by a strong band of fibrous tissue of 2 fingers' breadth proceeding upwards from behind the bladder and carrying with it a tongue-like process of the latter to be inserted by a broad expansion into the fundus of the uterus a short distance below its highest point. A finger could be passed between this anchoring band and the front of the lower segment. The tongue of the bladder was dissected free, and the band dissected off the fundus. Before this was done it was impossible, even with the abdomen opened, to turn the child. As soon as its anchoring band was released, the fundus ascended and spontaneous cephalic version occurred. The band could only have arisen by passing one or more of the vaginal sutures through the cul de sac of the uterovesical peritoneum so often seen after pushing up the bladder in repair operations. Or in this case it is possible that a more exact procedure of vaginal fixation of the fundus had been carried out after deliberately opening the uterovesical pouch as is

practised by some gynaecologists. The patient's recovery was uneventful.

The President referred to the occurrence of transverse lie in some types of bicornute uterus and said that in the last case the post-operative band produced a similar kind of uterine deformity. Professor Jeffcoate (Liverpool) referred to 2 cases of Bowen's disease of the vulva, previously published but not reported to the Society, pointing out some of the histological features. He said that although the naked-eye and microscopic appearances are characteristic, the diagnosis is not always easy.

THE Fifth Meeting of the North of England Obstetrical and Gynaecological Society was held at the Royal Victoria Infirmary, Newcastle, on Friday, 4th June, 1948, with the President (Mr. J. E. Stacey) in the Chair.

Mr. Stanley Way (Newcastle) described:

A VARIANT OF MEIGS'S SYNDROME

The patient, a 5-para, was aged 61 according to herself and 65 according to her relatives. She had menstruated regularly, 3/28, until 2 months before admission.

In 1941 she first noticed swelling of the abdomen and her doctor carried out paracentesis and arranged for her admission to a hospital. There she was evidently thought to be suffering from a malignant condition and no active treatment was carried out. Between 1941 and 1943 paracentesis was carried out 17 times and she gradually became weaker, her weight falling from 15½ to 6¾ stones. When examined in 1943 she was found to have ascites and a large solid tumour in the right half of the lower abdomen. She also had a bilateral hydrothorax, greater on the right than the left. By this time, too, she had developed gross uterine prolapse with complete inversion of the vagina, while the rectal mucosa was prolapsed 4 inches. A diagnosis of Meigs's syndrome was made and, after withdrawal of one pint of clear straw-coloured fluid from the right pleural cavity, laparotomy was carried out on 12th April, 1943. The large tumour on the right side of the pelvis was then found to consist of 2 tumours closely associated with each other. One was cystic and had the fimbriated end of the Fallopian tube stretched over it; this proved to be an ovarian cyst with intracystic papillae. The larger solid tumour was extra-peritoneal within the layers of the broad ligament, adherent to the right wall of the bladder, and was subsequently shown to be arising from the round ligament. It was lifting up the peritoneum and displacing the uterus to the left. Its only blood supply was from a large artery in the round ligament. Both tumours were easily removed and the patient made a good recovery. Repeat X-ray examination 2 weeks later demonstrated complete disappearance of the pleural effusions.

Histological examination of the solid tumour showed a fibrous stroma infiltrated with adenocarcinoma. The tumour was reported as being a well differentiated one, practically free from nuclear irregularities and mitotic figures but clearly infiltrating small blood vessels and lymphatics. Its exact nature has never been clearly ascertained. No other primary growth was discovered and it must be assumed, if this was a true carcinoma, it had probably been primary in the fibroma.

The patient's response to treatment was satisfactory. She commenced to gain weight and resumed her household duties for the first time in 2½ years. In October 1943, the utero-vaginal and rectal prolapse was repaired, again with a good result. The patient remains well more than 5 years after the initial operation. Her weight is about 15 stone. She is active and walks about 4 miles a day. The patient herself, apparently in good health, was shown to members of the society.

This case presents several interesting features, not the least of which is the curious nature of the tumour. It shows once again the importance of exploring cases of suspected malignant ovarian tumour with ascites, no matter how hopeless they may appear to be. This point was first brought out, not by Meigs, but by Lawson Tait as long ago as 1882, when he said that occasionally solid ovarian tumours associated with fluid in the abdomen and chest proved to be benign and he appealed at that time for a more radical attitude towards this type of case, so that these patients may not be condemned to many years of misery when in actual fact they can be cured.

There is no obvious explanation as to why this patient continued to menstruate until the age of 61, and unfortunately endometrial biopsy was not carried out at the time of the operation.

Mr. Way went on to point out that although fibromata are the most common tumours to be associated with Meigs's syndrome, it may occur in the presence of other ovarian tumours. He considered this case to be unique in so far as it is the only recorded case of an extra-peritoneal tumour causing the syndrome.

The President commented on the many interesting features of the case and suggested that displaced ovarian tissue might be the source of origin of the solid tumour. Professor T. N. A. Jeffcoate (Liverpool) asked why it was assumed that the extra-peritoneal solid growth, rather than the intra-peritoneal cystic one, was the cause of the ascites. Mr. Way replied that the possibility of the cyst being responsible could not be excluded.

Mr. T. G. Robinson (Newcastle) described:

Two Cases of Full-time Extrauterine Pregnancy.

Case 1.—Mrs. McF., age 33, 1-para, was admitted as a case of toxaemia of pregnancy. The exact duration of pregnancy was unknown. She had hypertension and albuminuria and after one week's conservative treatment it was decided to induce labour. The foetus appeared at term by size, its position was R.O.A. and the foetal heart was heard. On an attempt being made to rupture the forewaters the uterus was found to be empty—a finger could be passed through the cervix up to the fundus.

It was decided to delay operation for 12 hours while chemotherapy was commenced and X-ray examination carried out. During the interval the foetal heart ceased to beat. At operation the gestation sac was opened through a bloodless area and a 7-pound male stillborn foetus removed. The placenta, which was attached to the posterior layer of the broad ligament and the pouch of Douglas, was not disturbed and the abdomen was closed without drainage. The patient made an uninterrupted recovery.

This patient, operated on 2 years previously, was shown at the meeting and the placental mass, although continually decreasing in size, was still palpable in the hypogastrium.

Case 2.—Mrs. R., age 33, 3-para, was admitted as a case of antepartum haemorrhage on 23rd December, 1947. In early September she had attended the hospital clinic complaining of irregular periods and some lower abdominal pain. She then appeared to be 16 weeks pregnant and no abnormality was noted. She did not see a doctor again until the time of the haemorrhage which brought about her admission to hospital. At examination on 30th December, 1947, the pregnancy appeared to be near term and there was a good deal of abdominal tenderness. The temperature and pulse-rate were raised and, since the patient admitted attempts to "get rid of the pregnancy", a tentative diagnosis of peritonitis was made and chemotherapy commenced. The patient's condition improved until 13th January, when she suffered acute abdominal pain accompanied by a rise in temperature and pulse-rate. The possibility of extrauterine pregnancy was then entertained and the diagnosis confirmed by hysterosalpingography. At operation the same day a macerated foetus with wry-neck and weighing 7 pounds 5 ounces was delivered from sac. As soon as it was lifted out severe haemorrhage commenced from the placental site on the posterior abdominal wall. This was controlled initially by pressure applied by the assistant and, after closure of the abdomen, by pads and binder. Blood transfusion was commenced at once and in all 5 pints were given. The amount of bleeding at first was enough to cause real anxiety but the patient's condition slowly improved and she was discharged from hospital 44 days after operation.

In this case there was evidence of haemorrhage occurring before operation and this recurred as soon as the pressure of the foetus was removed—and that despite the fact that care was taken not to disturb the placenta. This patient was also demonstrated at the meeting and the placental mass was easily palpable.

Mr. Robinson went on to give a brief review of the literature dealing with advanced abdominal pregnancy, pointing out the progress made in treatment in recent years. Nowadays with the practice of leaving the placenta and closing the abdomen, together with blood transfusion and chemotherapy, the mortality has been reduced to reasonable proportions. Some authors still advise removing the placenta if it is technically easy but the difficulty is to decide which placenta can be safely removed without first taking the risk of disturbing its attachment. The chief hope for the foetus in these cases lies in early diagnosis, but here the difficulty is that the clinical signs vary considerably

from case to case and the experience of any one surgeon is limited by the rarity of the condition. Many of the deformities described are of the acquired type and due to the unusual attitude which the foetus may adopt. If the child survives these may correct themselves or be amenable to treatment later.

The President referred to his experience of 3 cases of advanced ectopic pregnancy. In one of these, in which he had left the placenta in the abdomen, he operated again 15 months later for secondary abdominal pregnancy. At that time there was no sign of the placenta remaining from the first pregnancy. Mr. F. Stabler (Newcastle) pointed out that, although it is a good general rule not to remove the placenta, in some cases the placenta is almost pedunculated and can be removed easily and safely. Mr. F. Burke (Sunderland) agreed and said in one such case he found a rudimentary uterine horn in relation to the placental pedicle. In a second case of a full time broad ligament pregnancy the placenta was inadvertently partially separated and the resulting haemorrhage necessitated packing and marsupialization of the sac. The patient died 12 hours later. Professor Farquhar Murray (Newcastle) said there was no advantage in marsupialization of the sac and also mentioned one case in which the whole placenta was retained within the Fallopian tube although the foetus was within the abdomen. Mr. Scott Russell (Manchester) thought that it was unwise ever to advise removal of the placenta at this type of operation. Dr. Newton (Manchester) gave an account of 1 case in which the placenta, not disturbed at the time of the operation, was discharged through the abdominal wound on the 10th day. Mr. Jeaffreson (Leeds) said he had experience of 3 cases of abdominal pregnancy and pointed out that contrary to the textbook description it is often unusually difficult to palpate foetal parts. Dr. Herd (Liverpool) said that in this, as in many other conditions, once the decision to operate has been take it should not be deferred even a few hours. Mr. Bryan Williams (Middlesbrough) emphasized that even when the greatest care was taken haemorrhage was not always avoidable and described operating on a case of a 16 weeks' abdominal pregnancy in which the placenta separated spontaneously at the time of operation and resulted in the most alarming loss of blood which was only controlled by packing. Both Mr. Stabler (Newcastle) and Mr. Harvey Evers (Newcastle) had seen cases in which the child had been delivered alive but died subsequently.

Mr. Robinson replied, agreeing that abdominal palpation of the foetus can be difficult in these cases and emphasizing that, although there may be a few cases in which the placenta can be safely removed, it is difficult to know which they are without taking a great risk at the time of operation.

Mr. Linton Snaith (Newcastle) read a paper on:

THE USE OF OESTROGENS IN UTERINE INERTIA.

He pointed out this was by way of a preliminary note based on recent clinical experiments. After reviewing the literature dealing with the changes in the level of oestrogens in the blood and urine during pregnancy, abortion and labour he went on to mention some modification in views on the actions of oestrogens which had come to light recently. Thus, contrary to the traditional view, it is even suggested by some workers that oestrogen injection can postpone the onset of parturition in some animals, and that increased uterine activity may be the result of oestrogen withdrawal. Despite the inconclusive evidence provided by animal experiments there is a fairly widespread belief that oestrogens are effective in stimulating the uterus to evacuate a dead pregnancy, for induction of labour and in the treatment of inertia. In considering the use of oestrogen for such purposes it is important to bear in mind the problems raised by what is known about the metabolism of these substances, their inactivation and excretion. Also, and possibly having some bearing on these problems, is the question of the route of administration. Since oral administration and the intramuscular injection of oestradiol esters in oil make for slow absorption they may have considerable disadvantages where the treatment of inertia is concerned. Loeser has recently described a rapid vascular change in the endometrial bed following the intravenous injection of oestrogen and it seemed possible that this route might be preferable where induction of labour or treatment of inertia is concerned. A clinical trial was therefore carried out, using oestradiol in propylene glycol, 25 mg. per c.cm.

An attempt to induce labour was made in 10 cases at or near term. In one case the membranes were already ruptured and labour started half an

hour later. In one other case expulsive contractions commenced 5 hours after the injection, but in the remainder labour did not begin for 32 to 164 hours after treatment, and then usually after artificial rupture of the membranes.

Nine cases of uterine inertia were also treated. In all cases the membranes were already ruptured. The duration of labour varied from 7 to 52 hours. All patients had had feeble " pains ". A total of 125 mg. of oestradiol was given in each case, either in 1, 2, or 3 injections. In 1 case after 40 hours of ineffective labour there was an improvement in contractions half an hour to an hour after injection, and subsequent labour lasted 11 hours. In one other case strong backache occurred for about an hour, coming on half an hour after the injection, but the backache subsided and ultimately Caesarean section was carried out after 75 hours delay because of a breech presentation in an elderly primigravida. In 4 other cases improvement in contractions occurred after a lapse of 2 hours or more, but one of these also had Pitocin in one-unit doses hourly into an intravenous drip. In 2 other patients, who had reached 2 to 3 finger dilatation after 20 hours or more, the intravenous injection produced no effects whatsoever and delivery took place 30 hours or more later, in one case by Caesarean section. None of the patients experienced untoward symptoms following the intravenous injection, although some experienced a sensation of heat in the arm.

Mr. Linton Snaith concluded that in these series of experiments there was no convincing evidence that the uterus had been sensitized by oestrogens. When improvement in uterine function did occur the time lag was extremely variable, from 0 to 24 hours. Moreover his experience of using stilboestrol either before or during labour led him to the view that it does not significantly influence the onset of labour or the quality of contractions during labour. Finally he pointed out that, although inertia has different causes, the important thing is to make the uterus contract efficiently, and if oestrogens have the action which is claimed for them they should be of value in all cases.

The President said that he, in common with most obstetricians, had used stilboestrol and other oestrogens both for induction of labour and for inertia. Although an apparently good effect was sometimes seen he had never been completely convinced of their value. Professor T. N. A. Jeffcoate (Liverpool) said that some of his earlier work and writings in this respect were often quoted, but not always correctly. In the past he had perhaps been rather too enthusiastic; yet any claims and observations he had made had been cautious. Although the value of oestrogen therapy in cases of intrauterine death of the foetus seemed reasonably certain, further experiences of its use in inertia made him even more sceptical of its efficacy. One of the difficulties is to justify the treatment on theoretical grounds. In the first place the majority of cases of inertia have a nervous or mechanical cause and in these it is not reasonable to expect a good result. Even if an endocrine upset is ever to blame there remains the difficulty that oestrogens are not oxytocic in the ordinary sense and animal experiments go to show that it takes at least 12 hours for uterine contractions or sensitivity to be influenced. The maximum effect of oestrogen is only obtained after 4 to 5 days, and that after repeated administration. In his view the intravenous route did not counteract the time lag. Indeed, it is doubtful whether an immediate change in uterine function should ever be regarded as a successful response. He went on to say that he too had used intravenous injections of oestradiol in propylene glycol both during pregnancy and labour, using repeated injections of 125 mg. each, and once giving as much as 500 mg. in a single injection without the patient suffering ill effect. Some injections had been given at the time of operation with the uterus under direct vision. He had never seen any obvious change either in vascularity or activity of muscle during the time of observation or during operations such as hysterotomy or Caesarean section. Nor had any cases of uterine inertia or inco-ordinate uterine action been definitely benefited although, as with any form of treatment, some had appeared to be—if only temporarily.

Dr. R. Newton (Manchester) said he had found oestrogens appear to improve uterine function in some cases but their action was inconstant. He had got the impression that they sometimes resulted in painless labour when given in late pregnancy. He also pointed out that prolonged labour is not necessarily pathological. Mr. Scott Russell (Manchester) emphasized the different types and causes of inertia and said that some may not

be pathological. Professor Farquhar Murray (Newcastle) also said that a long first stage with intact membrane is of little consequence, Mr. Harvey Evers (Newcastle), however, pointed out that contrary to the usual statement the foetus may suffer harm during prolonged labour even while the membranes are intact. Mr. Linton Snaith replied and said that unduly prolonged labour could never be regarded as completely normal. It required treatment not only in the immediate interests of the mother and child, but keeping in mind its possible effects on future childbearing.

Mr. Stanley Way (Newcastle) read a paper on:

INFARCTION OF THE UTERUS

The uterus, without doubt, had one of the best vascular supplies of any organ in the body and therefore infarction was extremely difficult to produce. Nevertheless, in certain circumstances it could occur, although these were very rare. The literature contained practically no mention of this condition, but in the last 12 years he had met with 4 examples, all of different aetiology. He would make clear at the outset what he meant by infarction. The word infarct was usually reserved for a localized area of necrosis resulting from the cutting off of the blood supply to that particular area. When, however, a wide area of tissue was filled with multiple small infarcts often only reconizable as infarcts when seen through a microscope, the word necrosis was frequently applied to this condition. In this paper there were examples of both types and he had used the term infarction somewhat loosely to cover both types of necrosis.

The first case was tragic and occurred some 12 years ago. A woman of 21 years was admitted almost moribund with gangrene of both feet. She had been confined at home 4 weeks previously and the doctor had prescribed 1 dram of liquid extract of ergot twice daily for 2 or 3 days. In error the patient had been given 1 ounce twice daily for 3 weeks. The patient died shortly after admission and autopsy revealed generalized contraction of blood-vessels, many of them containing thrombi. There were multiple infarcts throughout the body. The uterus was completely involuted, all 4 main vessels contained organized thrombi, and the uterus itself was turned into a solid infarct which on section was structureless. Here was an example of a chemical agent producing arterial spasm and thrombosis resulting in infarction.

The second case concerned a woman of 58 admitted in 1942 with acute abdominal pain and vomiting of 12 hours' duration. She had a tender mobile mass in the lower abdomen, and at operation this proved to be a uterine fibroid which on account of gross elongation and atrophy of the supravaginal cervix, had caused axial rotation of the uterus through more than a complete circle, carrying with it both ovaries. All 4 vessels were completely strangulated and showed recent clots in their lumina, and the uterus was plum-coloured and necrotic. The patient made a good recovery after subtotal hysterectomy. A more extreme example of this was described some years ago by Bastianelli in which, following rotation and infarction, spontaneous amputation occurred, leaving the uterus free in the abdominal cavity. This was an example of infarction due to mechanical obstruction to the blood supply.

In 1944 a woman aged 35 was admitted to the Maternity Hospital with a diagnosis of threatened abortion. She was 14 weeks pregnant and had had slight vaginal bleeding for one week prior to admission. She had had one normal delivery 5 years previously. On examination there was only slight vaginal bleeding and the os was closed. The only other abnormal finding was that her blood-pressure was 180/120. Ten hours after admission she complained of sudden abdominal pain, collapsed and died all in the space of about 10 minutes, and just before she died she expelled from the vagina a complete ovum. At autopsy she was found to have an extensive atheroma of the aorta and of the renal arteries, and many of the smaller vessels. The left ovary and the left cornu of the uterus were completely infarcted and the left ovarian artery showed a considerable degree of atheroma and contained a fresh thrombus which extended into the finer ramifications of this vessel and presumably prevented thereby any collateral circulation from the opposite ovarian or the uterine arteries. The actual cause of death was acute heart failure. Both kidneys were extensively damaged by ischaemic changes and showed several old infarcts. This was an example of vascular disease producing thrombosis and consequent infarction.

In the 4th case a woman of 58 complained of vaginal haemorrhage and the only positive finding was a soft patulous and irregular cervix. Under anaesthesia the cervix appeared gangrenous and a

portion taken for section showed thrombosis of the small vessels and extensive septic infarction. A few days later the patient confessed that a week prior to her first attendance at hospital her cervix had prolapsed and she had taken a pair of scissors and tried to cut it off. She succeeded in getting a small piece off but a fierce haemorrhage had caused her to desist. Seven days after admission she developed severe pain in the left iliac fossa. She then appeared ill and the uterus felt considerably enlarged. In the left broad ligament close to the uterine cornu was a thickening which had not been there before and which was exceedingly tender to the touch. On these findings, and in the light of previous experience, a diagnosis of thrombosis near the left cornu was made and total hysterectomy carried out. A large vessel at the left cornu was thrombosed, and the endometrium over that area was gangrenous. Section of the cut edge of the fundus showed an extensive area of superficial necrosis and probably even more infarction would have occurred if operation had been deferred. Culture from the cavity of the uterus showed anaerobic streptococci and *Clostridium welchii*. After hysterectomy and, with the aid of sulphonamides, the patient made an excellent recovery. This was an example of thrombi caused by a septic process, which probably started as a result of the patient's self-interference, and was spread by the biopsy.

We thus had 4 ways in which thrombi might be formed; a chemical agent, mechanical obstruction, vascular disease, and a septic process. In an organ with such a good blood supply as the uterus total infarction must be extremely rare, and its power of recovery from anything short of total vascular occlusion must be extremely good. The circumstances pertaining to all these cases were rare and unusual, and it was little wonder that the literature was so silent about what must be a rather uncommon manifestation.

The specimens from cases 2, 3 and 4 were shown.

The President said that, as compared with other types, septic infarction and necrosis was the most common and he thought this kind of lesion was often the basis for the cases of persistent sub-acute cellulitis sometimes seen. He asked how it was possible to diagnose infarction. Dr. R. Newton (Manchester) referred to cases of criminal abortion induced by injecting caustic alkalis and resulting in massive gangrene or infarction of all the pelvic organs. He as well as Professor Farquhar Murray (Newcastle) asked whether concealed accidental haemorrhage was to be regarded as infarct? Mr. Way replied, saying that the essential point in diagnosis, as in the diagnosis of infarcts anywhere in the body, was the sudden onset of excruciating pain. Concealed accidental haemorrhage was not infarction but consisted in extravasation of blood. The extensive necrosis and gangrene sometimes seen in cases of criminal abortion and puerperal sepsis was not quite in the same category as the cases he had described. He regarded them as necrosis which was probably due to the infection itself, whereas his paper was mainly concerned with localized necrosis following ischaemia due to septic thrombosis.

REVIEW OF CURRENT LITERATURE

The Journal is fortunate in being able to run this Review in conjunction with the Abstracting Service of the British Medical Association. All the abstracts of this service which cover obstetrical and gynaecological literature and literature on the new-born are at our disposal. The Review will, however, contain in addition abstracts and titles of articles which, though not of sufficient general interest for publication in the monthly volumes published by the British Medical Association, are yet sufficiently important for a specialist journal. It is to be hoped that our readers will collaborate in the preparation of these abstracts. Those who are willing to take part in the service are invited to communicate with the Editor, The Abstracting Service, B.M.A. House, Tavistock Square, London, W.C.1. There is special need of abstracters in foreign languages, and when offering his or her services the writer should indicate the language (apart from English) in which he or she is proficient. The name of the abstracter will be acknowledged in the text and payment will be made at the rate of ten shillings per abstract for English articles and twelve shillings and sixpence per abstract for articles from foreign languages.

INDEX

ANATOMY 1016

PHYSIOLOGY 1021

PREGNANCY 1051

LABOUR 1137

ANAESTHESIA 1163

PUERPERIUM 1176

LACTATION 1187

THE INFANT 1194

MATERNAL MORBIDITY AND MORTALITY 1228

OBSTETRIC OPERATIONS 1233

MISCELLANEOUS 1244

GYNAECOLOGY

- General 1250
- Disorders of function 1251
- Sterility 1276
- Abnormalities of the reproductive organs 1289
- Infections of the reproductive organs 1294
- New growths of the reproductive organs 1310
- Operations 1372
- Miscellaneous 1410

ANATOMY.

1016. **A Simple Pelvimeter to be Used with the Triangulation Method to Pelvimetry.**
By T. A. KENDIG. *Radiology*, **50**, 395–399, Mar. 1948. 3 figs., 2 refs.

1017. **Observations on Foetal Hysterosalpingography.** (Ricerche di isterosalpingografia fetale.)
By I. CESA. *Radiologia, Roma*, **8**, 605–613, 1947. 6 figs., 6 refs.
This work, carried out at the Institute of Medical Radiology of the University of Rome, largely confirms and amplifies our knowledge of the anatomy of the uterus and Fallopian tubes in the foetus and new-born. It describes in detail the relation between the body and cervix of the uterus, the insertion and direction of the tubes, and the several types of malformation of the uterus. The proportion of such malformations in the foetus is higher than that usually accepted in adults. In two-thirds of the cases both tubes were patent, in 13 per cent only one tube was patent, and in 20 per cent both tubes were closed. The author admits, however, that non-patency on injection of an opaque substance did not necessarily always mean congenital occlusion. *A. Orley*

1018. **Spiral Arteries in the Human Ovary.**
By B. DELSON, S. LUBIN, and S. R. M. REYNOLDS. *Endocrinology*, **42**, 124–128, Feb. 1948. 3 figs., 8 refs.

1019. **The Relationship of the Vagina to Adjacent Organs in Reconstructive Surgery. A Histologic Study.**
By J. V. RICCI, J. R. LISA, C. H. THOM, and W. L. KRON. *Amer. J. Surg.*, **74**, 387–410, Oct. 1947. 8 figs., 10 refs.
This is a histological study of 22 specimens obtained from foetuses, infants, and adults, each consisting of the fundus, cervix, urethra, vagina, rectum, anal canal, and perineal body removed *en masse*. Its purpose was to determine whether there are fascial sheets which could be isolated and used as supporting structures in the repair of cystoceles and rectoceles. The vaginal wall was found to be a compact fibro-muscular elastic structure. Its muscle fibres are not separated into two distinct layers of inner circular and outer longitudinal fibres, but consist of circular and longitudinal fibres irregularly distributed. In old age the muscle atrophies and the vagina is mainly a fibro-elastic structure. The anterior vaginal wall and the urethra are fused together. Between vagina and bladder there is a cleavage plane of loose areolar tissue. Posteriorly there is a line of cleavage between vagina and rectum extending from the pouch of Douglas to the apex of the perineal body and formed by non-vascular loose areolar tissue, but the perineal body tightly fuses the vaginal wall to the anus. The authors conclude that there is no evidence to substantiate belief in the existence of fascia beween urethra and vagina, between bladder and vagina, between perineo-anal canal and vagina, and between vagina and rectum, defining " fascia " as a connective-tissue sheet of variable thickness and possessing tensile strength. Such designations as vesico-vaginal, pubo-cervical, and recto-vaginal fascias are gynaecological misconceptions, and these terms should be struck out of the literature of gynaecological anatomy. *F. J. Browne*

1020. **Histologic Appearance of Coiled Arterioles in the Endometrium of Rhesus Monkey, Baboon, Chimpanzee and Gibbon.**
By I. H. KAISER. *Amer. J. Obstet. Gynec.*, **55**, 699, Apr. 1948.

PHYSIOLOGY.

1021. **Early Effect of X-rays on Ovaries of Normal and Adrenalectomized Rats.**
By M. ICKOWICZ. *Proc. Soc. exp. Biol., N.Y.*, **66**, 646–649, Dec. 1947. 3 figs., 5 refs.
In a previous paper the author has demonstrated that irradiation produces pyknotic nuclei of the granular cells of the ovary, including those of the young follicles and those in the resting state. He has also observed that during the first few hours after irradiation ovarian lesions are limited particularly to follicular cells. The object of the present study was to determine the effect of adrenalectomy on pyknosis of the follicular cells of the rat ovary during the first few hours after X-ray irradiation. Highly inbred albino rats were divided into three groups: adrenalectomized rats, irradiated rats, and adrenalectomized and irradiated rats. The first group was killed 24 hours after operation and the others 4 hours after irradiation. Histology showed that previous adrenalectomy inhibited the production by X-ray irradiation of the pyknotic lesions in the granular layer of the ovarian follicles. *Doreen Daley*

1022. **Relationship between Cervical Mucus and Basal Temperature Cycles.**
By W. T. POMMERENKE and E. VIERGIVER. *Amer. J. Obstet. Gynec.*, **54**, 676–681, Oct. 1947. 17 refs.
Cyclic variations in some of the physical properties of cervical mucus of normal women are well recognized; the object of this study is to correlate these changes with basal temperature variations.
A total of 15 healthy young women with normal menstrual histories and no pelvic abnormality served as subjects in the investigation. Eight of them were known to be fertile. Nearly all were studied through at least 3 cycles, and a total of 80 cycles was observed. The amount of cervical mucus secreted increased markedly for the 3 to 7 days of the mid-cycle and reached its peak in the middle of this phase. The day of maximal production usually occurred from 16 to 12 days before the

onset of the subsequent menstrual period regardless of the length of the cycle. Basal temperatures were recorded in a total of 65 cycles on 14 subjects, and all showed the usual ovulatory diphasic curve. The temperature shift occurred from 16 to 12 days before the subsequent period in 88 per cent of cycles. When the day of maximal mucus secretion was correlated with the time of the basal temperature shift it was found that the two phenomena occurred simultaneously in only 52 per cent of the cycles studied. In 18 per cent of the cycles secretion was maximal 1 to 2 days before the shift, and in 30 per cent 1 to 2 days later. However, in only 2 of 38 temperature charts with well-defined rise did that rise occur outside the period of increased mucus production. The suggestion is made that a study of the cervical mucus cycle, together with the basal temperature chart, may be useful in planning pregnancies. *Doreen Daley*

1023. **The Determination of Reducing Substances in Human Cervical Mucus.**

By E. VIERGIVER and W. T. POMMERENKE. *Amer. J. Obstet. Gynec.*, **54**, 459–466, Sept. 1947. 21 refs.

Cervical mucus of women menstruating normally is most abundant, most translucent and acellular, and of lowest viscosity, at the time of ovulation. Spermatozoa penetrate the cervical mucus with greatest ease at the time of lowest viscosity, but other properties may be operative in aiding or hindering the migration of spermatozoa through the cervical canal. Because of MacLeod's demonstration that the metabolism of human spermatozoa is largely glycolytic and his suggestion that there may be a suitable substrate in the female genital tract to maintain the motility of the spermatozoa, the authors decided to examine the cervical mucus for glucose, related reducing substances, or their precursors. Young healthy women with normal menstrual histories and normal pelvic findings were the subjects of study. Details are given of the collection of mucus, the estimation of its water content, and the measurement of the reducing substances. Throughout the menstrual cycle the mucus is found to contain free reducing substance, and on hydrolysis additional quantities are found. The various reducing substances are present in lowest concentration in the ovulatory phase. The possible significance of these findings with reference to sperm metabolism is discussed.

Anthony W. Purdie

1024. **Examination by Peritoneoscope of the Mechanism of Ovulation.** (Der Mechanismus der Eiabnahme im Laparoskop.)

By R. ELERT. *Zbl. Gynäk.*, **69**, 38–43, 1947. 2 figs., 15 refs.

The mechanism by which the ovum gains access to the Fallopian tube after being discharged from the ovary is of interest. For a long time it was assumed that the ovum was discharged with the follicular fluid and aspirated by the fimbrial and tubal ciliary current from the pouch of Douglas into the Fallopian tube. According to this theory neither the ovary nor the muscular activity of the Fallopian tube played any active part. Rouget was the first to show that the suspensory and ovarian ligaments contained smooth muscles fibres and to suggest that they caused a change in the position of the Fallopian tube which helped the reception of the ovum. Von Mikulicz-Radecki, in 1935, described the following changes in the position of the Fallopian tube and ovary which he had observed at the time of follicle ripening. The ampulla is hyperaemic, and the fimbriae arrange themselves in a rosette round the lower pole of the ovary; contractions in the Fallopian tube are marked at this stage and pass from the fimbriated end towards the uterus. The Fallopian tube lies like a curtain over the ovary, and the fimbriae are in a favourable position for the reception of the ovum. Caffier has made similar observations at laparotomy, and has suggested that the follicular fluid and ovum were squirted out from the ovary and caught by the Fallopian tube.

The author has observed 1 case by peritoneoscopy. The patient, aged 20 years, was thought to have an ectopic pregnancy, but at laparoscopy no evidence of tubal pregnancy was found. The fimbriated end of the left Fallopian tube was not adjacent to the ovary. The right ovary lay deeply in the pouch of Douglas. The right Fallopian tube, whose fimbriated end and ampullary part were hyperaemic, lay on the surface of the ovary. While the author was looking at the Fallopian tube the infundibula and the ampulla disappeared from view and a few seconds later the fimbriae apeared stretched out over the surface of the ovary. The isthmial part of the Fallopian tube could not be observed during this time. The fimbriae, a few seconds later, detached themselves from the ovary and the Fallopian tube now lay along the surface of the ovary as at the time of the first observation. The whole process lasted for 2 minutes. This observation leads the author to believe that the Fallopian tube plays an active part in taking off the ovum from the ruptured follicle. This finding also confirms Westman's observation on rabbits and monkeys. **Gladys Dodds*

1025. **Investigations of Ovulation in Rats.** (Ovulationsuntersuchungen an Ratten.)

By F. BESOLD. *Z. Geburtsh. Gynäk.*, **129**, 70–103, 1948. 6 refs.

1026. **Characteristics of the Normal Menstrual Cycle.**

By J. W. GOLDZIEHER, A. E. HENKIN and E. C. HAMBLEN. *Amer. J. Obstet. Gynec.*, **54**, 668–675, October 1947. 4 figs., 9 refs.

For many years Fraenkel's statement that " the only regular feature of menstruation is its irregularity " has been repeated in the literature. Several studies of apparently normal menstrual

cycles are unsatisfactory in that proof of ovulation is not provided and the normality of some cases included in the series is open to doubt.

The authors of this paper have studied 109 women examined for sterility. Full investigations were carried out, and no patient with organic or functional ovarian disorders, endocrine disease, or uterine abnormality was included. The patients were aged between 20 and 42 years, most of them being between 25 and 35. A total of 524 cycles was studied and correlated with basal rectal temperature records in every case and endometrial biopsies in some.

Of the 524 recorded cycles, 95.4 per cent were ovulatory, 2.5 per cent anovulatory, and 2.1 per cent indeterminate. The length of the cycle in more than half of the women who were ovulating was between 26 and 29 days, while 92.8 per cent fell within the 23- to 36-day interval. No cycles shorter than 19 days were recorded, and only one was longer than 60 days. The anovulatory cycles ranged from 16 to 38 days and indeterminate ones from 15 to 37 days. The length of the oestrogenic phase was 10 to 16 days in the majority of women, but in nearly one-fifth of the cycles it was longer than 17 days. A short oestrogenic phase is unusual. The progestational phase is more constant in length, and in 94 per cent of cycles it lay between 10 and 16 days. The duration of bleeding was between 3 and 5 days in two-thirds of the cases and, except for one cycle, the limits were between 3 and 9 days. Basal temperature records showed that the difference before and after ovulation was 0.6° to 0.9° F. (0.33° to 0.5° C.) in 78.9 per cent of cycles; in 10 per cent the rise was 1° to 2°F. (0.55° to 1.15° C.) and in 11 per cent the rise was small. The rise was sharp and the curve became level at once in some cases, but in 69.3 per cent the rise continued for 1 to 4 days. In others it occurred more gradually. These studies do not yield new information on the exact correlation of ovulation and temperature rise.

A total of 61 menstrual biopsies was examined. All 58 biopsies in patients with temperature charts suggesting ovulation were found to show progestational change. In 86.3 per cent, histological studies and temperature studies of the length of the progestational phase agreed to within 48 hours. Only two biopsies yielded information significantly different from that obtained from the temperature records. Of the three biopsies taken during cycles judged anovulatory by the temperature chart, two showed late oestrogenic endometrium and the third inexplicably showed full-blown progestational changes despite a flat temperature record.

Doreen Daley

1027. **The Factor of Previous Treatment in Experimental Menstruation.**

By D. H. PHELPS. *J. clin. Endocrinol.*, **7**, 611–623, September 1947. 5 figs., 7 refs.

The present report is based on a series of 107 episodes of uterine bleeding produced in 9 ovariectomized rhesus monkeys. Procedure (*Amer. J. Anat.*, 1946, **79**, 167) included the administration of oestrogens (500 i.u.) with or without progesterone (1 to 2 mg.) daily. By correlation of the duration of bleeding with observations made simultaneously on intraocular endometrial transplants (Markee, *Contr. Embryol. Carneg. Instn.*, 1940, **28**, 219) it was shown that: " (1) the influence upon the endometrium of a single course of treatment with ovarian hormones may extend through one or more subsequent cycles; (2) permanent changes in the structure of the endometrial vascular bed may result from stimulation by the ovarian hormones; (3) the architecture of the endometrial vascular bed at the beginning of any given course of treatment with ovarian hormones influences the duration of the uterine bleeding produced by that course of treatment." These findings imply that the " pre-existing vascular structure " is one of the factors concerned in the control of uterine bleeding. It seems reasonable to suppose that the pre-existing vascular structure—that is, the structure of the endometrial vascular bed at the beginning of the growth phase of the cycle—is not constant in ovarian failure. Clinically this factor may prove useful in evaluating menstrual symptoms and results of hormone therapy.

[These results were obtained on castrated animals, and similar effects were not observed by Goldzieher *et al.* (*Amer. J. Obstet. Gynec.*, 1947, **54**, 636) in the human female.] *Magnus Haines*

1028. **Blood-sugar Levels during the Menstrual Cycle and its Relation to Therapy with Follicular Hormone and Syndromes Associated with Diminution in Oestrogens.** (El nivel glucémico durante el ciclo estral y su influenciacion por la terapéutica folicular en los sindromes hipoestrogenicos.)

By J. DE DIOS GOMEZ VILLALBA. *Actualidad méd., Granada*, **24**, 76–79, February, 1948. 21 refs.

1029. **The Vegetative Nervous System during the Menstrual Cycle. Its Reactions in Relation to Changes in the Cardiovascular System.** (Il sistema nervosa vegetativo durante il ciclo mestruale. Sue reazioni attraverso le modificazioni dell'apparato cardiovascolare.)

By G. CATALDI. *Riv. ital. Ginec.*, **30**, 347–363, 1947. 59 refs.

1030. **Action of an Intestinal Extract on Uterine Contraction.** (Action d'un extrait intestinal sur la contraction uterine.)

By H. VIGNES and C. LEVASSEUR. *Gynéc. et Obstét.*, **46**, 652–654, 1947. 2 figs.

1031. **Does Relaxin Exist?** (La relaxine existe-t-elle?)

By R. COURRIER and M. MAROIS. *C.R. Soc. Biol., Paris*, **141**, 1202–1203, Dec. 1947. 6 refs.

1032. **Relaxation of the Pelvic Ligaments in Guinea-pigs by Estrogens and Prostigmine.**
By F. E. Emery and A. H. Lawton. *Amer. J. Physiol.*, **151**, 134–137, Nov. 1947. 4 figs., 12 refs.

1033. **The Instability of Oestrogens in Solution.**
By A. E. W. Smith and P. C. Williams. *J. Endocrinol.*, **5**, 152–157, July 1947. 4 refs.

The authors have previously reported the loss of oestrogen potency of dienoestrol and stilboestrol, while the chemical instability of similar solutions was demonstrated independently by Warren and Gulden. The present paper describes the examination of some of the conditions affecting the stability of these and other oestrogens in solution. Solutions were prepared by dissolving 10 mg. of the oestrogen in 100 ml. of absolute alcohol or acetone. Aliquot portions of these solutions were diluted with the solvent to be investigated to give 1 μg. per ml., and dilutions of these stock solutions were made at intervals for biological testing. A trace of toluene was added to the aqueous and urinary solutions to prevent bacterial or mould contamination. All except the urinary solutions were kept at room temperature.

Spayed rats were injected with 0.1 ml. of solution twice daily for 3 days and vaginal smears were taken twice daily for the two following days. Smears consisting entirely of cornified and/or epithelial cells were regarded as positive and the results expressed on a percentage basis.

It was found that dienoestrol and stilboestrol lose oestrogenic potency when kept in aqueous solution or in solution in alcohol or acetone. Oestrone, hexoestrol, and oestradiol are relatively stable under the same conditions. The instability of dienoestrol and stilboestrol is greater when the solutions are aerated or in the presence of benzoyl peroxide or hydrogen peroxide. The loss of activity may be partially inhibited in the presence of hydroquinone. All five oestrogens are relatively stable in dilute solution in sesame oil and in normal men's urine kept at low temperature. *Doreen Daley*

1034. **The Relation between Direct and Indirect Oestrogenic Function in a Series of Synthetic Oestrogens.**
By G. Brownlee and A. F. Green. *J. Endocrinol.*, **5**, 158–165, July 1947. 3 figs., 15 refs.

Administration of oestrogens to experimental animals is followed by a number of effects, which vary with the dose. The proliferatory changes in the vagina, uterus, and nipples are direct effects, while changes in mammary development and lactation, which are mediated through the anterior pituitary gland, may be regarded as indirect. Diethylstilboestrol has been shown to differ functionally from the naturally occurring oestrogens only in a few minor respects. The object of the present investigation is to determine whether modification of the diethylstilboestrol structure results in compounds with different ratios of direct to indirect oestrogenic activity. Six of the compounds have been compared for their effect in increasing uterine weight in immature spayed rats and inhibiting lactation in the parturient rat. Administration of these compounds was found also to cause loss of granules from almost all cells in the pars glandularis of the anterior pituitary, with increase in number of the reserve cells and a decrease in the proportion of eosinophil cells. The uterus showed gross hypertrophy with convolutions of the epithelium and vacuolation of the mucosa. In the mammae there was loss of active secretory tissue and in the adrenals congestion and vacuolation of the cortex with similar changes in the medulla in extreme cases.

In the present series of compounds the relative physiological efficiency is the same whether tested on the uterus or by suppression of lactation, and similarity of effect on anterior pituitary, adrenals, and ovaries has also been demonstrated. The effects on lactation are greatly increased when the mother has undergone ovariectomy. The slope of log-dose/uterine-weight curves for different oestrogens given by the same route varies, and provides evidence of varying rates of absorption and elimination. There is also considerable difference in comparative activities by different routes. One compound (4.4′ - dihydroxy - α,β, - 2,2′ - tetramethylstilbene) with similar activity after subcutaneous injection in oil is five or six times as active as diethylstilboestrol by mouth and three times as active when incorporated in the diet of rats. *Doreen Daley*

1035. **A Comparison of the Growth of the Ovum and Follicle in Normal Rhesus Monkeys, and in Monkeys Treated with Oestrogens and Androgens.**
By S. H. Green and S. Zuckerman. *J. Endocrinol.*, **5**, 207–219, Nov. 1947. 7 figs., 25 refs.

The ovaries of 13 rhesus monkeys, 2 of which had been treated with oestrone and 3 with testosterone propionate, were serially sectioned and the size of the oöcyte, nucleus, and follicle was measured. The percentage of follicles with different numbers of layers of granulosa cells was also determined. Regression equations were calculated for the relation of the size of the ovum to the size of the follicle and considered separately for the two phases of growth—that in which both ovum and follicle grow and that in which no further growth of the ovum takes place and the follicle alone increases in size. In neither phase was a statistically significant difference found for the relative growth of ovum and follicle between the normal and the treated animals. Androgen stimulated considerably the development of the early stages of follicular growth, but did not affect the later stages. Oestrogen prevented the later stages of follicular development and caused widespread atresia in the earlier stages. Both androgens and oestrogens seem to have a direct influence on the ovaries. *H. Herxheimer*

1036. **Fate of Some Oestrogenic Phenanthrene and Stilbene Derivatives in the Rat.**

By A. T. NIELSEN, K. PEDERSEN-BJERGAARD and M. TONNESEN. *J. Endocrinol.*, **5**, 111–114, July 1947. 12 refs.

This work was planned to determine whether natural oestrogens are less active when given by mouth than when administered parenterally and whether synthetic oestrogens have much the same activity by either route. Other workers had concluded that oestrone, unlike stilboestrol, is not inactivated by the liver.

All assays were carried out on adult spayed rats, which had been subject to previous priming with an oestrone injection. Test substances were given in aqueous solution or suspension, and results were assessed on the dosage necessary to produce complete vaginal cornification in 50 per cent of the animals. Oral, subcutaneous, and intravenous (portal and femoral) routes were investigated and the effect of the various oestrogens was also studied in a group of rats whose liver function had been depressed by carbon tetrachloride. The results showed that the six oestrogens compared could be divided into three groups: (1) Those oestrogens which are not inactivated by the liver whether they are given orally or parenterally—stilboestrol and dienoestrol. (2) Those oestrogens which are inactivated by the liver when given orally—oestrone, oestradiol, and hexoestrol. (3) Those oestrogens which are inactivated by the liver whether given orally or parenterally—oestriol.

Doreen Daley

1037. **Interrelation between Vitamin C and Follicular Hormone.** [In Russian.]

By M. D. SHEINERMAN and V. G. GERSTEIN. *Akush. Ginec.*, No. 4, 23–27, 1947.

Two series of experiments were conducted to determine the relation between vitamin C and folliculin. In the first series, 48 adult castrated white mice were divided into 4 groups of 12 animals; the first group received 6 mg. of vitamin C daily for 3 days; the second group the same dosage of vitamin C followed by 0.5 mouse unit of folliculin; the third group 0.5 mouse unit of folliculin followed by the same dosage of vitamin C; and the fourth group received 0.25 mouse unit of folliculin with the same dosage of vitamin C as the other animals (18 mg.). The presence or absence of oestrus was determined by vaginal smears. No oestrus occurred in the first and fourth groups; oestrus occurred on the fourth day in the second and third groups. In the second series 24 infantile rats were divided into 4 groups of 6 animals; the first group received 60 mg. of vitamin C in 2 days; the second group received 25 μg. of crystalline folliculin; the third group received 25 μg. of crystalline folliculin and 60 mg. of vitamin C; and the fourth group served as controls. At the end of the experiment the rats were killed and the weight of each uterus was determined. The average weight of the uterus in animals of the first group was 0.051 g.; the smallest uterus in either of these groups weighed 0.038 g. and the largest 0.066 g. The average weight of the uterus in animals of the second group was 0.093 g.; the smallest uterus weighed 0.016 g. and the largest 0.121 g. The average weight of the uterus in animals of the third group was 0.262 g.; the smallest uterus weighed 0.120 g. and the largest 0.305 g. It is concluded as the result of these experiments that ascorbic acid potentiates the action of oestrogens.

Nicolas Tereshchenko

1038. **The Formation Mechanism of Oestrogenic Hormones. II. The Presence of the Oestrogen-Precursor in the Ovaries of Rats and Guinea-pigs.** [In English.]

By L. CLAESSON and N. A. HILLARP. *Acta physiol. scand.*, **14**, 102–119, Sept. 30, 1947. 8 figs., 36 refs.

This series of experiments at the Histological Institute, Lund, is designed to study a sterol oestrogen-precursor in the ovaries of rats and guinea-pigs in oestrus. Ovaries were removed from albino rats and guinea-pigs at different phases of the cycle, during pregnancy, and after coitus (rats only). Ovaries were also studied after injections of the gonadotrophins. Frozen sections (10 μ), fixed in formalin for at least 10 days, were examined according to the methods applied by the authors to rabbit ovaries (*Acta physiol. scand.*, 1947, **13**, 115). Determinations by polarized light and by the Schultz reaction yielded identical results in rabbits, but occasionally divergent results were obtained in rats and guinea-pigs. The authors claim that the precursor, which they consider to be similar to, if not identical with, cholesterol, is formed mostly in the interstitial part of the ovary in rabbits, rats, and guinea-pigs, and to some extent in the theca interna of rabbits and rats.

Magnus Haines

1039. **The Endometrium in Old Age.** (Endometrio senile.)

By L. GIANAROLI. *Riv. ital. Ginec.*, **30**, 61–113, 1947. 14 figs., 44 refs.

An extensive study of the modifications of the endometrium in old age is useful to distinguish the normal process of involution from the pathological. The author has examined the endometrium in 50 women from the menopause to advanced old age. Detailed tables are given. Three fundamental types of change have been observed in the mucosa of the uterine body and are as follows: (1) Simple and generalized atrophy. In this, the reduction in volume of the various tissue elements is uniform; it has the same characters as the simple atrophy found in other organs in old age, and is due to the same biological factors. (2) Cystic atrophy. This is described as the appearance of small cystic cavities which are sometimes spread all over the mucosa and sometimes (15 per cent) are crowded into one part of the mucosa, especially near the

fundus of the uterus, forming polypoid growths. These cystic changes suggest a slow secretory activity of the epithelium, probably of ovarian origin. The formation of the simple cystic polyp of old age is related to the intensity of the secretory stimulus. (3) Modifications of circulatory character. A dilatation of the capillaries of part of the mucosa sometimes extends to those of the myometrium. Such alterations are possibly of mechanical origin (arteriosclerotic lesions). The frequent occurrence of telangiectasia in this series (26 per cent) has led the author to believe that the determining factor is vascular, active enlargement of the capillaries taking place possibly under the influence of an ovarian stimulus. Haemorrhages often found in the endometrium and the myometrium (20 per cent of all cases) are of secondary importance. The phenomena described often vary in their intensity, and more than one type of lesion may be present in the same uterus. The cysts, the simple cystic polyp, and the telangiectases are the consequence of temporary irregular reactivation of ovarian function. The appearances in the endometrium and ovaries examined suggest to the author that functional activity of the ovary may still be present in old age. *Rina Saunders*

1040. **A New Colorimetric Method for the Determination of Pregnandiol.**
By J. W. GOLDZIEHER. *J. Lab. clin. Med.*, **33**, 251–253, Feb. 1948. 2 figs., 7 refs.

1041. **The Quantitative Determination of Small Amounts of Pregnandiol in Human Urine.**
By I. F. SOMMERVILLE, N. GOUGH, and G. F. MARRIAN. *J. Endocrinol.*, **5**, 247–257, Jan. 1948. 16 refs.

1042. **A Simplified Technique for the Quantitative Colorimetric Estimation of Pregnandiol in Urine.**
By H. S. GUTERMAN and M. S. SCHRODER. *J. Lab. clin. Med.*, **33**, 356–366, Mar. 1948. 4 figs., 14 refs.

1043. **Effects of Prostigmine on the Genital System of the Rat.** (Effetti della Prostigmina sulla sfera genitale della ratta.)
By A. MARTELLA. *Riv. ital. Ginec.*, **31**, 205–212, 1948. 4 figs.

1044. **Production of Antihormones as a Result of Treatment with Mares' Serum Gonadotrophin.** (Antihormone-Dannelse ved Behandling med Hoppeserum-Gonadotropin.)
By C. HAMBURGER. *Ugeskr. Læg.*, **110**, 434, Apr. 8, 1948. 2 refs.

1045. **Studies on Urinary Secretion of Gonadotrophins.** (Nuove ricerche sulla gonodotropinuria nei tumori ovarici.)
By P. PARACCHI and E. GALLICO. *Tumori*, **21**, 264–273, 1947. 5 figs., 33 refs.

1046. **Studies on the Bioassay of Hormones. The Assay of Estrogens by a Chick Oviduct Method.**
By R. I. DORFMAN. *Endocrinology*, **42**, 85–92, Feb. 1948. 3 refs.

1047. **Studies on the Bioassay of Hormones. The Assay of Pregnant Mare's Serum Chorionic Gonadotrophin.**
By R. I. DORFMAN. *Endocrinology*, **42**, 93–97, Feb. 1948. 3 refs.

1048. **Studies on the Bioassay of Hormones. The Comparative Oviduct Response of Various Breeds of Chicks to Stilbestrol.**
By R. I. DORFMAN. *Endocrinology*, **42**, 102–106, Feb. 1948. 6 refs.

1049. **Distribution of Estradiol between Serum and Red Cells.**
By F. BISCHOFF and R. E. KATHERMAN. *Amer. J. Physiol.*, **152**, 189–196, Jan. 1948. 3 refs.

1050. **Relation of the Pineal to the Female Sex Organs.** (Rapporti fra pineale ed organi genitali femminili.)
By N. PASSALACQUA. *Mon. ostet.-ginec.*, **18**, 149–168, July-Dec. 1947. 7 figs., Bibliography.

PREGNANCY.

1051. **Radiographic Morphology of the Renal Pelvis and Ureter in Pregnancy.** (Morfologia radiografica del tratto pelvi-ureterico in gravidanza.)
By I. CESA and V. MASINI. *Radiologia, Roma*, **8**, 623–633, 1947. 10 figs., 70 refs.
This paper from the Institutes of Obstetrics and Gynaecology and of Medical Radiology, University of Rome, is based on 50 intravenous pyelographies carried out on women between the fourth and ninth months of a normal uncomplicated pregnancy. The authors consider the alterations observed in the urinary tract in all the cases examined as physiological. These changes became manifest at about the fourth or fifth month of pregnancy and became more accentuated as the pregnancy advanced. The changes observed were dilatation of the renal pelvis and calices, and dilatation, deformity, elongation, and kinking of the ureters. There is a discussion of the mechanical and dynamic theories of the changes in the urinary tract in pregnancy, and an eclectic theory, admitting both mechanical and dynamic causes, is advanced. *A. Orley*

1052. **Chinese Maternal and Fetal Measurements.**
By D. D. KULCSAR. *Chinese med. J.*, **65**, 397–428, Nov.-Dec. 1947. 7 figs., 28 refs.

1053. **The Elderly Primipara.** (Primiparidad añosa.)
By D. CARRIL SOLARI. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 141–151, Aug. 1947. 4 refs.

1054. **Duration of Pregnancy in Filipino Women. (A Preliminary Report.)**
By C. B. TEJADA. *J. Philippine med. Ass.*, **34**, 83–88, Feb. 1948.

1055. **Emotional Factors in Obstetrical Practice.**
By P. A. REYNOLDS. *California Med.*, **68**, 151–153, Mar. 1948.

1056. **Studies in Rh-isoimmunization in Pregnancy. Observations in a Series of Ninety-six Sensitized Women.**
By M. S. SACKS, W. J. KUHNS, and E. F. JAHN. *Amer. J. Obstet. Gynec.*, **54**, 400–414, Sept. 1947. 36 refs.

This paper presents a summary of findings in the University of Maryland School of Medicine, Baltimore, during 13 months' work from August 1, 1945, to August 31, 1946. In this period a total of 12,275 patients was studied. Of these, 12,140 were an unselected group and 135 were specially referred to the laboratory as known Rh-negative subjects.

In the unselected group the division between Rh-positive and Rh-negative groups (as tested by potent anti-Rh O serum) conformed to general experience, being respectively in white patients 84.4 per cent : 15.6 per cent, and in negroes 92.7 per cent : 7.3 per cent. Out of the total 12,275 patients there were 96 deliveries in patients who exhibited various Rh antibodies. Of these, 86 were classified as Rh-negative, and 10 as Rh-positive. These represent respectively 4.84 and 0.095 per cent of the total Rh-positive and Rh-negative populations. It is pointed out that 9 of the 10 Rh-positive patients belonged to the debatable Rh′ and Rh″ groups, and that only 1 patient exhibited Hr immunization (being of group Rh_1). Of the Rh-negative women with Rh-positive husbands the percentage showing immunization was 5.26 per cent. Nine were primigravidae and 77 were multiparae, these figures representing respectively 1.24 and 8.48 per cent of the population at risk. The general incidence of erythroblastosis foetalis was 1 in 215 (0.46 per cent). In a total of 79 immunized patients delivered at the time of the study the incidence of erythroblastosis was only 67.1 per cent.

It was possible to determine the specificity of the anti-bodies in 38 of the immunized patients. The figures were respectively:

Anti-Rh_0	32 cases	= 84.2 per cent
Anti-Rh_1	4 cases	= 10.5 per cent
Anti-Rh_2	1 case	= 2.6 per cent
Anti-Hr	1 case	= 2.6 per cent

Pure anti-Rh′ and anti-Rh″ were not encountered. The type of antibody in the total of 96 immunized patients was univalent (incomplete, blocking) in 65 (67.7 per cent), bivalent in 23 (24.1 per cent), and univalent and bivalent in 8 (8.3 per cent). No instances of erythroblastosis due to A-B-O incompatibility were observed. Low titre anti-O antibody was observed occasionally, without evidence of damage to the infant.

The quantitative study of the antibodies was carried out in a wide variety of diluents, including serum, plasma, and bovine albumin solution, the sensitivity of the test appearing to increase from serum through plasma to albumin. It is therefore necessary to specify the diluent in comparing the results in differing titrations, and an agreed standard technique is desirable.

The authors observed the first appearance of antibodies during pregnancy in 16 cases. In 11 of these this transition was delayed until the last trimester. They noted that in the production of erythroblastosis the duration of immunization appeared less important than the actual titre reached by the antibodies. In a group of 19 patients in whom it was possible to compare antenatal and postnatal levels of antibodies, a significant rise in titre was noted after delivery, and in some cases the increase was very large, much larger than that observed in any case during pregnancy. It is deduced that labour is a potent factor in the stimulation of antibody formation, possibly through the release into the maternal circulation of large numbers of foetal erythrocytes, due to " placental rupture ". Persistence of the antibodies was observed for periods of 1 to 60 months after immunization. This was judged in some cases as dating from the birth of a previous child affected with erythroblastosis.

The influence of parity on immunization was also studied. Six out of 10 immunized primigravidae gave a history of previous transfusion; in the remainder the authors do not discount the possibility of a forgotten intramuscular injection of whole blood in childhood. The immunization was detected in the second pregnancy in 41 out of 86 parous patients; in the remaining 45 the event was scattered between third and eleventh pregnancies.

[The assumption that the sharp increase in antibody titre after labour may be due to placental flooding of the maternal circulation appears rather unsatisfactory, and it might be put forward as an alternative speculation that the withdrawal of the foetus and placenta might allow an increase in circulating antibodies, which had previously been fixed by the foetal antigens. The most menacing fact which emerges is the frequency with which immunization occurred at the time of the second pregnancy. The need to strive for a living baby in the first pregnancy of an Rh-negative woman married to an Rh-positive man becomes of peculiar importance, even allowing for the fact that the quoted incidence of immunization is only 5.26 per cent. The authors' plea for standardized technique in antibody titration is obviously justified, and a plea for standardization of Rh nomenclature is equally worthy of support.]

W. I. C. Morris

1057. **Antenatal Blood Group Determination. A Preliminary Report.**

By S. H. POLAYES, S. LUBIN, and J. MCNALLY. *Amer. J. Obstet. Gynec.*, **55**, 524-526, Mar. 1948. 2 refs.

1058. **Biological Reactions of Pregnancy at the End of Pregnancy and in the Puerperium.** (Die biologische Schwangerschaftsreaktion am Ende der Gravidität und im Wochenbett.)

By C. A. JOEL. *Gynaecologia, Basel*, **125**, 151-162, Mar. 1948. 4 figs., 9 refs.

1059. **Studies in Carbohydrate Metabolism in Pregnancy.** (Ricerche sul ricambio glucidico in gravidanza.)

By V. GIRARDI. *Ginecologia, Torino*, **14**, 1-19, Jan. 1948. 9 figs., 59 refs.

1060. **Composition and Structure of the Liver Cell in Pregnancy.**

By H. W. KOSTERLITZ and R. M. CAMPBELL. *Nature, Lond.*, **150**, 676-677, Nov. 15, 1947. 3 refs.

The desoxyribose nucleic-acid content of the liver of pregnant rats was shown to be significantly increased by the third week of gestation and was greater than could be accounted for by the increase in maternal body weight. The total amount was related to the sum of maternal and foetal body weights and was independent of the diet. A specific rise of 40 to 45 per cent in the ratio of ribose nucleic to desoxyribose nucleic acids also occurred; this was not due to dietary changes during pregnancy and was correlated with foetal body weight. The increased ribose nucleic-acid content was particularly apparent in the periportal area. Glycogen content of the liver was much decreased. *J. Dawson*

1061. **Renal Function Tests in Pregnancy.** (A propos de l'exploration fonctionnelle des reins au cours de la grossesse.)

By M. MAYER and J. THOYER-ROZAT. *Gynéc. et Obstét.*, **46**, 683-686, 1947.

1062. **The Thrombokinase Content of the Placenta.** (Uber den Thrombokinasegehalt der Placenta.)

By W. NEUWEILER and —. SCHWAB. *Gynaecologia, Basel*, **125**, 163-169, Mar. 1948. 1 fig.

1063. **Oxygen Uptake of Human Placental Tissue as Affected by Selected Substrates and Drugs.**

By H. P. JAMES, H. W. ELLIOTT, and E. W. PAGE. *Proc. Soc. exp. Biol., N.Y.*, **67**, 130-132, Feb. 1948. 12 refs.

1064. **On a Normal Human Embryo of Seventeen Days' Development.**

By G. G. ROBERTSON, S. L. O'NEILL, and R. H. CHAPPELL. *Anat. Rec.*, **100**, 9-21, Jan. 1948. 19 refs.

1065. **Critical Study of the Method of Dorn and Sugarman for the Diagnosis of Foetal Sex During Pregnancy.** (Etude critique de la méthode de Dorn et Sugarman pour le diagnostic du sexe de l'enfant pendant la grossesse.)

By D. TROLLE. *Rev. franç. Gynéc.*, **42**, 345-353, Dec. 1947. 15 refs.

1066. **Study of Progesterone Formation in the Foetal Adrenal.** (Untersuchungen über die Progesteronbildung in der fötalen Nebenniere.)

By F. HOFFMANN. *Zbl. Gynäk.*, **69**, 43-48, 1947. 1 fig., 13 refs.

It has not yet been demonstrated that the foetus takes part in the production of hormones with an effect on pregnancy. This study is interesting because it shows that progesterone is formed in small quantities in the last three months of pregnancy by the foetus.

The suprarenal gland is a relatively large organ in the newborn infant; it weighs 6 to 8 g., while the approximate weight in the adult is 12 g. This, together with the fact that the gland involutes rapidly after birth, suggests that its hormone may play some part in the endocrine control of pregnancy. The author describes his own method for extraction and identification of small quantities of the hormone. The suprarenal cortex contains 1 corner unit (1 mg.) of corpus luteum hormone in 100 to 180 g.; the ovarian cortex contains the same amount in 100 g. The foetal suprarenal in the last three months of pregnancy contains about 4 to 4.5 units of corpus luteum hormone, but none in earlier months. Thus, progesterone is formed in the foetus at the stage in pregnancy when there is decreased formation by the placenta and corpus luteum.

Quantitative estimations of progesterone during the second half of the menstrual cycle and during pregnancy were also carried out. The progesterone content on the 14th day of the menstrual cycle was just over 2 units; it rose to 6 units from the 18th to the 24th day and thereafter fell rapidly, practically to zero by the 34th day. During pregnancy the progesterone content at the 2nd month was 6 units, at the 4th month 10 units, at the 6th month 6 units, at the 7th month 5 units; it then diminished rapidly, so that during the 9th and 10th months there was very little progesterone.

It is suggested that the foetal suprarenal plays an active part in diminishing the production of progesterone from the corpus luteum of pregnancy and from the placenta. *Gladys Dodds*

1067. **A Diagnostic Reaction in Pregnancy and the Action of Gonadotrophins on the Male Toad.** (Reacción diagnóstica de embarazo y acción de la gonadotrofinas en el sapo macho.)

By C. GALLI MAININI. *Bol. Soc. méd. Mendoza*, No. 33, 97-108, Sept. 1947. 21 refs.

Details are given of the experimental work on

which is based the pregnancy test known in South America by the author's name. Since 1923 Houssay and his colleagues in Buenos Aires have published a series of articles showing the relation between the hypophysis and testicle of the male toad *Bufo arenarum* Hensel. After subcutaneous injection into this animal of 10 ml. of urine from cases of pregnancy, spermatozoa appear in the bladder urine, which may be obtained for examination by the insertion of a pipette into the cloaca. Altogether 1,937 toads have been used. Those weighing 100 g. or more are preferred for the tests, as negative results are found in those of 60 to 70 g. The same animal should not be used more than four times. The duration of captivity does not affect the result unless it is prolonged. If the animal is kept at a temperature of about 24° C. it is more sensitive, and also when kept in the dark.

The minimum dose of chorionic gonadotrophin necessary to obtain a response is about 40 international units. Enormous doses cause spermatozoa to appear in the ureter in 10 minutes and in the bladder in 20 minutes. Removal of the liver increases the sensitivity of the animal. Intracardiac injection is more effective than intramuscular, subcutaneous, or intraperitoneal, and intragastric injection is ineffective. Traumatism of the testicle, renal and testicular congestion, and ligation of the ureter may give positive results. The sensitivity of reaction was not varied by dividing the dose, by unilateral castration, by destruction of the medulla, or by anaesthesia. Positive results were obtained by the implantation of the hypophysis of the rat and the rabbit, and by injection of bovine follicle-stimulating hormone but not of follicle-stimulating hormone from the urine of normal and menopausal women. Consistently negative results were obtained with oestrogens, progesterone, thyroxine, adrenaline, desoxycorticosterone, " pitressin ", zinc sulphate, methylene blue, and extracts from the urine of normal and menopausal women.

The test was carried out in 485 cases of pregnancy, and in 90 per cent of the positive cases the result was available within 2 hours, the quickest result being obtained within 40 minutes. In 169 of 177 cases the result was identical with that of the Friedman test. In the remaining cases in which the diagnosis was known, the result proved the toad test to be the correct one. In 180 non-pregnant patients the test was consistently negative. The mortality among the toads used was 0.9 per cent, as opposed to that of 4.3 per cent for the rabbits used for the Friedman test. The results were positive in cases of amenorrhoea of 4, 5, 12, 16, and 17 days' duration. Between the sixth and ninth month of pregnancy positive results were obtained with the urine in 92 per cent of cases, and with the serum in 69 per cent of cases. No relation was found between the amount of serum injected and the result. The test permits a quantitative estimation of the amount of chorionic gonadotrophin in the urine in pregnancy.

The author believes that this test has the advantages of being simple, rapid, specific, and easy to read owing to the absence of the personal factor. *Bryan Williams*

1068. **Ovulation in the South American Toad *Bufo arenarum* after Chorionic Gonadotrophin.** (Ovulación del " Bufo arenarum " con gonadotrofina coriónica.)

By C. GALLI MAININI. *Rev. Soc. argent. Biol.*, **23**, 299–302, Dec. 1947. 4 refs.

1069. **The Most Practical Biological Test for Pregnancy.** (De meest practische biologische zwangerschapstest.)

By G. VANDENBERGHE. *Belg. Tijdschr. Geneesk.*, **4**, 360–364, Apr. 15, 1948. 6 figs.

1070. **Melanophore Diagnosis of Pregnancy.** (Le mélanophorodiagnostic de la grossesse.)

By L. SERVANTIE and G. F. MORETTI. *Sem. Hôp. Paris*, **24**, 642–645, Mar. 14, 1948. 30 refs.

1071. **Early Diagnosis of Pregnancy by the Galli-Mainini Reaction in Some Brazilian Amphibia.** (Diagnostico precoce da gravidez pela reacao de Mainini em alguns anfibios Brasileiros.)

By M. I. MELLO. *Hospital, Rio de J.*, **33**, 57–64, Jan. 1948. 4 figs., 20 refs.

1072. **Some Features of Radiological Diagnosis in Obstetrics.** (Algunos aspectos del diagnóstico radiológico obstétrico.)

By V. FONT SASTRE. *Med. esp.*, **19**, 58–63, Jan. 1948. 4 figs.

1073. **Toxaemia of Pregnancy.** (Toxemia da gravidez.)

By S. T. GARBER and N. S. ASSALI. *An. brasil. Ginec.*, **25**, 87–100, Feb. 1948. 12 refs.

1074. **Clinical and Aetiological Features of Hypertension and Albuminuria during Pregnancy.** (Note sur certains aspects cliniques et étiologiques de l'hypertension et de l'albuminurie observés au cours de la gestation.)

By J. BRET. *Rev. franç. Gynéc.*, **43**, 57–71, Feb. 1948.

1075. **Functional Pathology of Toxaemias of Pregnancy.** (Pathologia funcional de las toxemias gravidicas.)

By A. NOVO GONZÁLEZ. *Med. esp.*, **19**, 7–22, Jan. 1948.

1076. **Serum Glucuronidase Activity During Normal and Toxaemic Pregnancy.**

By D. F. MCDONALD and L. D. ODELL. *J. clin. Endocrinol.*, **7**, 535–542, Aug. 1947. 3 figs., 26 refs.

The glucuronidase level in serum was determined in 54 non-pregnant and 100 pregnant women, and 24 patients with toxaemia of preg-

nancy. It gradually increases during pregnancy from 5.3 μg. per ml. to nearly 14 μg. Twelve patients with hypertensive toxaemia had similar values, whereas those with pre-eclamptic or eclamptic toxaemia had increased glucuronidase levels, ranging from about 20 to 50 μg. The reason for the increase during pregnancy is still unknown.

H. Herxheimer

1077. **Lack of Nuclear Segmentation of Neutrophil Granulocytes in Toxaemias of Pregnancy.** (Sull' insegmentazione del nucleo dei granulociti neutrofili nelle tossicosi gravidiche.)

By U. BRACALE. *Arch. Ostet. Ginec.*, **56**, 31–44, Jan.-Feb. 1948. 21 refs.

1078. **Haematology of Pregnancy: The Bone Marrow in the Toxaemias.** (Estudios sobre hematología de la gestación: La medula osea en las gestosis.)

By M. MONTOYA GÓMEZ. *Clín. y Lab.*, **45**, 172–179, Mar. 1948. 7 figs., 4 refs.

1079. **Concentrated Plasma in the Treatment of the Severe Late Toxaemias of Pregnancy.**

By A. GOLDEN and G. FRASER. *Amer. J. Obstet. Gynec.*, **54**, 523–528, Sept. 1947. 27 refs.

Twice-concentrated plasma is advocated for toxaemic anuria with or without eclampsia. It is claimed that its colloidal osmotic action reduces oedema, relieves haemoconcentration, increases the diminished circulating blood volume, and increases urinary output. The only serious danger of this treatment is that of circulatory overloading. In the 5 cases reported this was avoided by giving only 300 ml. at a time. The plasma is used only as an addition to routine treatment, as, for example, when administration of hypertonic glucose appears to be failing. The 5 cases reported were all severe and responded promptly to the plasma.

Aileen Dickins

1080. **Further Observations on the Use of the Neutral Diet and Hydration in the Treatment of Toxaemias of Late Pregnancy.**

By R. R. DE ALVAREZ. *Amer. J. Obstet. Gynec.*, **54**, 445–458, Sept. 1947. 12 refs.

This paper is an evaluation of a standardized form of treatment of cases of toxaemia of late pregnancy by a neutral diet, administration of ammonium chloride, abundant fluids, rest in bed in hospital, and sedation.

The neutral diet consists of foods which yield an equal amount of acid ash and alkaline ash, to which are added certain foods that yield an ash with no chemical reaction. These foods are prepared and served without the addition of salt and are selected because of their low sodium content. Neutral diet implies a diet which is salt-free and poor in sodium. Foods yielding different kinds of ash are listed. Sufficient water is required to carry off such products of metabolism as the kidneys ordinarily excrete. Fluids are supplied by mouth, parenterally, or by both routes, to ensure a minimum daily urinary output of 2 litres. A daily minimum intake of 4 litres may be necessary for this. Emphasizing that inundation with fluid is impractical and unnecessary, the author claims that forcing fluids in toxaemic patients increases oedema only when sodium bicarbonate or uncontrolled sodium-chloride ingestion is permitted; he records controlled experiments in support of this. Ammonium chloride is administered to release the sodium ion from the tissues and the intercellular fluid retained by the sodium. An average dose is 3 g. (in gelatine capsules of 0.5 g.) three times daily for 4 days. It is broken down in the gastro-intestinal tract and absorbed as ammonium and chloride ions. In the liver the ammonium ion combines with carbon dioxide and water to form ammonium carbonate, which is converted into urea and excreted as such in the urine. The kidney tends to reconvert urea to ammonium ion after prolonged ammonium-chloride administration, which is therefore restricted to 4 days; after 3 days' rest it is resumed. Ammonium chloride restores the extracellular fluid content to normal and hydrates the blood vascular system, thus freeing additional water for urinary excretion of solids.

The classification of the patients studied and the response to treatment are shown in the following table:

Type of Toxaemia	No Treatment	Improved	No Change	Progressive	Maternal Mortality
Unclassified	1	9	6	—	0
Benign hypertensive	—	12	3	—	0
Malignant hypertensive ..	2	1	3	3	3
Chronic vascular nephritis ..	—	1	—	—	0
Acute glomerulonephritis ..	—	1	—	—	0
Chronic glomerulonephritis ..	2	7	2	1	0
Mild pre-eclampsia	3	80	10	3	0
Severe pre-eclampsia	1	44	11	2	2
Eclampsia	—	14	2	—	1
Total	9	169	37	9	6
Percentages	4	75	16.5	4	2.67

When conservative methods fail to control pregnancy toxaemia, termination of the pregnancy by the most conservative means suited to the particular individual is indicated.

Anthony W. Purdie

1081. **Treatment of Hyperemesis Gravidarum with Hormone and Vitamin.**

By J. HIDALGO. *J. Philippine med. Ass.*, **34**, 93–94, Feb. 1948.

1082. **Treatment of Placenta Praevia. A Review of Cases Treated in the Glasgow Royal Maternity Hospital, 1941–1946. A—The Maternal Aspect.**

By H. STIRLING. *Edinb. med. J.*, **54**, 504–509, Sept. 1947.

In this review placenta praevia is classified as

"mild", corresponding to the better known "lateral" type, and "severe", which includes all other types. The diagnosis was made by digital examination without anaesthesia, except in a very few cases. During the 5-year period 505 cases of placenta praevia were treated, 222 being mild and 283 severe; 88 cases occurred in primigravidae (17 per cent), in whom the mild type was more common (63 per cent) than the severe. In multigravidae cases were more frequently severe (60 per cent). Postpartum haemorrhage developed in 32 cases and caused 3 deaths. Manual removal of the placenta was carried out on 8 occasions. Postpartum haemorrhage occurred more often in mild cases (10.8 per cent) than in severe cases (2.8 per cent) owing to the high incidence of Caesarean section in the latter group. Blood transfusion was given in 109 cases, 1 death resulting from incompatible transfusion. There were 18 maternal deaths (3.6 per cent), 4 in the mild group (1.8 per cent) and 14 in the severe group (5 per cent). Causes of death were: haemorrhage and shock, 8 cases; sepsis, 3 cases; respiratory infection, 2 cases; death under anaesthesia, 3 cases; acute cardiac failure in 1 case and an incompatible blood transfusion in another before delivery. Complications in the puerperium occurred in 69 cases, a morbidity rate of 13.7 per cent, 20 in the mild group (9 per cent) and 49 in the severe group (17.3 per cent). There were 8 cases of puerperal sepsis.

In the whole series 279 Caesarean sections were performed, of which 7 were classical. Spinal analgesia was employed in 82 cases with 1 anaesthetic death, and general anaesthesia in 170 cases with 1 anaesthetic death. A third anaesthetic death occurred after combined spinal and general anaesthesia, but was thought to be due to chloroform. Fatal complications were more frequent after general anaesthesia than after spinal analgesia. In 124 cases there was no treatment; rupture of the membranes was carried out in 65 cases, version in 32 cases, packing in 5 cases. Willett's forceps were not employed in any of the cases. In the mild group there was no treatment in 120 cases; rupture of the membranes was performed in 65 cases, Caesarean section in 27, version in 7, and packing in 3 cases. Choice of treatment did not appear to influence maternal mortality. In the severe group there were 252 Caesarean sections and 25 versions; 2 cases were treated by packing, and 4 received no treatment. Maternal mortality was lowest in the Caesarean section group (3.6 per cent), and highest in the small "no treatment" group (50 per cent in 4 cases). Treatment was delayed in 138 cases (27 per cent), vaginal examination not being made within 24 hours of admission. [From the subsequent paper, pregnancy continued for at least 7 more days in 62 (45 per cent) of these cases.] Of these cases 71 were mild, and 67 severe. Delay in treatment resulted in a slight increase in maternal mortality in both mild and severe cases; in a slight reduction in morbidity in mild cases; and in an increase in morbidity in severe cases. It was concluded that delay in treatment resulted in a slight but definite added risk to the mother. *Ian T. Fraser*

1083. **Treatment of Placenta Praevia. A Review of Cases Treated in the Glasgow Royal Maternity Hospital, 1941–1946. B—The Foetal Aspect.**

By R. A. TENNENT. *Edinb. med. J.*, **54**, 510–521, Sept. 1947.

In the cases of placenta praevia described by Stirling (Abstract 1082) 507 infants were born. Foetal mortality rate was 34.1 per cent, stillbirth rate 15.2 per cent, and neonatal death rate 18.9 per cent. Foetal mortality rate was 25.5 per cent in the mild group and 40.8 per cent in the severe group, due to the greatly increased neonatal death rate in the latter. The incidence of foetal abnormalities—anencephaly, hydrocephalus, talipes, exomphalos, and mongolism—was 1.35 per cent. Foetal mortality was related to birth weight, being very high in the groups of lowest weight, and still as high as 41.4 per cent (neonatal deaths 22.5 per cent) in the group weighing 5 to 6 lb. (2.25 to 2.7 kg.). Mortality fell to 12 per cent in the group weighing 6 to 7 lb. (2.7 to 3.15 kg.), owing to the great reduction in the neonatal death rate to 3.4 per cent; figures for the higher-weight groups remained at this lower level. The foetal mortality rate was 24 per cent where rupture of the membranes had been performed; 30 per cent in the "no treatment" group; 32 per cent in 284 Caesarean sections—11 per cent in 27 mild cases, in some of which placenta praevia was found unexpectedly in the course of an elective section, and 34 per cent in severe cases. Foetal mortality was highest where version had been performed—84 per cent in all cases, 29 per cent in mild cases, and 100 per cent in severe cases. The effect of delay in treatment has been carefully considered. Out of 139 such cases pregnancy continued for over 7 days in 62 (45 per cent). The foetal mortality was 31 per cent in the "immediate" group, and 42 per cent in the "delayed" group. Stillbirth rates were the same (15 per cent) in both groups, but neonatal deaths were much increased in the "delayed" cases (27 per cent compared with 16 per cent for the "immediate" cases); 56 per cent of infants in the "immediate" group and 45 per cent in the "delayed" group reached the "safe" weight of 6 lb. (2.7 kg.) or over. Very similar results were obtained in an analysis of cases treated only by Caesarean section. Conservative treatment is considered to have failed, in that it has not increased the likelihood of the infant reaching the "safe" weight of 6 lb., and has not increased the chance of ultimate survival. Moreover, as it increased maternal mortality and morbidity, conservative treatment is only justified in elderly primigravidae or women with no living children,

and is not advised in the majority of cases of placenta praevia. *Ian T. Fraser*

1084. **Treatment of Placenta Praevia. A Review of Cases Treated in the Edinburgh Royal Maternity Hospital and Simpson Memorial Pavilion, The Royal Infirmary, Edinburgh, During the Years 1926–1945.**

By J. STURROCK. *Edinb. med. J.*, **54**, 496–503, Sept. 1947. 4 refs.

During the period 1926–45, 828 cases of placenta praevia were treated. They are grouped into four 5-year periods to show the changing methods of treatment and the results obtained. In 1926–30 the method most often used was to bring down a leg, with or without the previous use of a pack (110 cases). Much less frequent methods were rupture of the membranes or expectant treatment (34 cases); Caesarean section (27 cases); vaginal pack alone (13 cases); Willett's forceps (3 cases); and hydrostatic bag (1 case). In contrast, during 1941–5 Caesarean section (74 cases) and rupture of the membranes or expectant treatment (74 cases) were most often employed. Willett's forceps were used in 47 cases, and were not considered to carry any special risk of sepsis; in 33 cases a leg was brought down.

Maternal and foetal mortality show a steady decrease in successive 5-year periods. This may be ascribed to various factors; the increasing use of blood transfusion; recognition that many of the minor degrees of placenta praevia were being overtreated; abandonment of the vaginal pack; and decreasing use of the procedure of plugging the lower segment with the half breech, which had resulted in many delayed deaths from shock, after it had appeared that haemorrhage had been controlled. Table I compares the maternal and foetal mortality in the different 5-year periods, and Table II shows the methods of treatment and the mortality.

Of the 32 maternal deaths 25 were due to haemorrhage and shock, 5 to sepsis (all in the years 1926–35), 1 to pulmonary embolism, and 1 to post-anaesthetic vomiting and shock. The foetal mortality of 39 per cent for the period 1941–5 compares unfavourably with that of 23.5 per cent obtained by Macafee of Belfast. Conservative treatment of placenta praevia is still seldom practised in Edinburgh owing to the lack of ante-natal beds, the alleged greater risk to the mother, and the fear of

TABLE I

Period	Cases	Maternal Mortality	Foetal Mortality
1926–30	188	7.4%	63%
1931–35	209	4.7%	67%
1936–40	203	3.0%	56%
1941–45	228	0.8%	39%

TABLE II

Method of Treatment	Cases	Maternal Mortality	Foetal Mortality
Leg brought down ...	265	7.2%	88%
Pack alone	24	12.5%	71%
Willett's forceps ...	131	2.3%	50%
Membranes ruptured or expectant treatment	231	1.7%	44%
Caesarean section ...	176	1.7%	28%
Bag alone	1	Nil	Nil

a higher incidence of congenital deformities of the foetus. During the period 1941–5 digital examination was delayed in 6.2 per cent of 674 cases of antepartum haemorrhage, and as a result only 6.1 per cent of cases of placenta praevia were treated conservatively, compared with Macafee's figure of 52 per cent of cases treated conservatively. *Ian T. Fraser*

1085. **Low Caesarean Section: The Surgical Treatment of Choice in Placenta Praevia.** (La césarienne basse. Traitement chirurgical de choix du placenta praevia.)

By J. N. MULLER. *Rev. franç. Gynéc. Obstét.*, **42**, 236–244, July-Sept., 1947.

The author reviews 199 cases of placenta praevia treated by him between 1919 and 1947. Cases treated during 1940–5 are not included. Fifty cases were delivered by lower-segment Caesarean section. The review has been divided into three parts: (1) 1919–26 (67 cases, 4 lower-segment Caesarean operations, 2 classical); (2) the transition period 1927–8 (32 cases, 11 lower-segment Caesarean sections, 1 Caesarean hysterectomy); (3) 1929–47 (100 cases, 35 lower-segment Caesarean sections). Of the 50 cases treated by the lower-segment operation, 1 mother died.

The author stresses the importance of admitting the patient to hospital after the first haemorrhage and also the need for avoiding examination and packing before admission. There were 79 foetal deaths in 199 cases of placenta praevia. If those cases are deducted where the foetal heart was not heard on admission and in which the birth weight was under 1,500 g., there remain 31 cases of foetal death (15.5 per cent). The foetal mortality has been halved in recent years. In period (1) there were 67 cases and 15 foetal deaths (22.38 per cent); in period (2) 32 cases and 5 foetal deaths (15.60 per cent); in period (3) 100 cases and 11 foetal deaths (11 per cent). By further exclusions the author reduces the last figure to 8 per cent. The foetal mortality in the cases treated vaginally (146) was 17.7 per cent, when the babies already dead or non-viable were deducted. In period (1) there were 5 maternal deaths out of 67 cases (7.3 per cent); in period (2) 3 maternal deaths out of 32 cases (9.3 per cent); in period (3) 3 maternal deaths out of

100 cases (3 per cent). The writer advises exteriorization of the whole uterus before incision of the lower uterine segment. In conclusion, a case of cervical placenta praevia accreta is described.

G. Gordon Lennon

1086. **Prevention of Repeated Miscarriage.**

By L. KURZROK and C. BIRNBERG. *Amer. J. Surg.*, **74**, 143–149, Aug. 1947. 11 refs.

The authors record a series of 27 cases of repeated miscarriage treated by anterior-pituitary-like hormone, corpus luteum hormone, and oestrogens. All the patients were delivered at term of live babies without any obstetric complications.

Anterior-pituitary-like hormone, 1,000 to 2,000 units, was given three times a week and corpus luteum hormone, 5 mg. three times a week, until the patient was 4½ months' pregnant; 1,000 units of anterior-pituitary-like hormone was then given twice weekly and 5 mg. of corpus luteum hormone twice weekly until the eighth month. In addition 0.5 to 1 mg. of α-oestradiol was given daily throughout, the actual dose depending on the estimated degree of genital hypoplasia; in a few cases ethinyl oestradiol, 0.05 mg. three times a day, was used instead. This treatment is based on the belief that the majority of miscarriages are due to faulty implantation and poor penetration of the syncytium in patients who have some degree of hypopituitarism and genital hypoplasia. Results were inconclusive with vitamin E therapy alone, with oestrogen and progestin therapy alone, and with "pregneninoline"; one patient showed hirsutism after taking the last-named for 4 to 5 months in doses of 20 mg. daily in the second half of the cycle.

The rationale of the authors' therapy lies in: (1) the finding of weak by positive, or of negative, Aschheim-Zondek reactions in patients subsequently proved to be pregnant, thus indicating poor production of gonadotrophic hormone; (2) the frequent occurrence of miscarriage at 3 to 3½ months and in women showing some evidence of hypopituitarism and genital hypoplasia, that is, at a time when the placenta should be taking over the endocrine functions of the degenerating corpus luteum. Serum gonadotrophin values fall if the foetus dies, though it has not yet been clearly shown whether this fall occurs before or after the death of the foetus.

The authors do not consider that the Rh factor plays any part in repeated miscarriage. They do not regard their therapy as a panacea for all miscarriages, but offer it as a successful advance in the endocrine therapy of miscarriage.

Hugh R. Arthur

1087. **Abortions: A Study with Emphasis on Treatment.**

By P. PETERSON. *Amer. J. Obstet. Gynec.*, **54**, 251–258, Aug. 1947. 6 refs.

This review covers a 10-year period from June 30,1936, to July 1, 1946, when 6,105 viable babies and 937 spontaneous abortions were observed by the author. The incidence of abortion was 15.35 per cent. An Aschheim-Zondek or Friedman test was performed on all cases of threatened abortion before treatment was started. Pregnancy tests were negative on admission in 292 out of 581 patients. The table below, which is taken from the text, lists the conditions thought to be responsible for the abortion.

Condition	No. of cases	%
Infantile uterus	77	13.2
Retro-displaced uterus	158	27.2
Low prothrombin level	19	3.2
Low oestrogen effect	168	28.9
Habitual aborters		
Low pituitary effect	37	6.3
Low progesterone effect	54	9.3
Low oestrogen-progesterone	68	11.7

In the series there were no abnormalities due to tumours, infections, or laceration of the cervix, neither did thyroid dysfunction play a part. No abortion was related to the effect of alcohol, lead, diabetes, or incompatibility of the Rh factor. The paternal influence was almost negligible. Vitamin E was of no demonstrable value. Progesterone may be harmful, and the author's results have been better since he gave up using it; in his opinion oestrogen therapy is more rational. He found a direct relation between the low glycogen content of endometrium and vaginal mucosa and diminished secretion of gonadotrophic hormone. The author considers that the causes of abortion may be grouped as: (1) maternal or environmental, and (2) ova with defective germ plasm.

There were three periods of treatment: (1) pre-conception, (2) post-conception, and (3) period of threatened abortion. Infantile uterus was treated by administration of 0.5 mg. of diethylstilboestrol in the first half of the cycle, followed by 10 mg. progesterone daily (orally) with 1 mg. diethylstilboestrol after the estimated day of ovulation to within 3 and 5 days, respectively, of the expected menses. Treatment was given for 3 consecutive months, then omitted for 3 months. A dilatation and curettage was performed at the end of each 3 months for endometrial study and reflex stimulation of the uterus. In the case of retrodisplacement of the uterus, 3 months after the miscarriage the uterus was replaced and a pessary inserted. If this failed, the uterus was replaced surgically and the pessary was left in place for the first 3 months of pregnancy. If abortion threatened, the patient was nursed in the prone position and in some cases a mercury bag was inserted into the vagina.

In cases in which there was a low prothrombin level 2 mg. of synthetic vitamin K was given intravenously daily for 6 days in the week preceding each period. If the prothrombin level was maintained, by increasing the dosage if necessary, the patient did not abort. Where oestrogen effect was low, during the waiting period of 3 months after miscarriage 0.5 mg. of diethylstilboestrol was given daily in the proliferative phase, and 1 mg. in the secretory phase until 5 days before the expected period. When pregnancy was being attempted 1 mg. doses were given without interruption. If the period was 1 week late 5 mg. daily was prescribed and the dose increased by 5 mg. every 2 weeks until the seventh month, and then reduced by 5 mg. every 10 days until it was completely withdrawn or delivery took place. If the administration was not stopped 3 weeks before the expected date of confinement these patients usually went past term. If bleeding occurred the dose was further increased by 5 mg. daily until symptoms were relieved.

The author considers that the group with low gonadotrophic effect comprises those cases of habitual abortion most amenable to treatment. Before conception 300 units of chorionic gonadotrophic hormone was administered twice weekly during the secretory phase, 0.5 mg. diethylstilboestrol was given daily during the proliferative phase, and 1 mg. diethylstilboestrol plus 10 mg. progesterone daily during the secretory phase up to within 3 and 5 days of the expected period. If pregnancy occurred the diethylstilboestrol was increased to 5 mg. twice daily and progesterone to 10 mg. three times daily with parenteral injections of each in cases of bleeding. The chorionic gonadotrophic hormone was increased to 500 units twice weekly. This treatment was given for 5 months of pregnancy. Thereafter it was felt that the placenta would supply sufficient hormone. At 7 months the treatment was started again and continued for 6 weeks. It was considered important that these patients should have a 20 per cent protein diet. The results of treatment in the group with low progesterone effect were not satisfactory. Missed abortion was particularly common. Treatment of the group with low oestrogen-progesterone effect gave only slightly better results than in the preceding group.

In cases of habitual abortion the author had 64 per cent of successes with his treatment as against a figure of some 27 per cent in untreated cases. The percentage of successes in non-habitual abortion was 98.6 per cent. *G. Gordon Lennon*

1088. **Blood Count, Takata-Ara Reaction Erythrocyte Sedimentation Rate, and Cell Mass in Incomplete Abortion Followed by Operative Intervention on the Uterus. Diagnostic and Prognostic Value in the Post-abortive Period.** (Esame emocitometrico, reazione di Takata-Ara, velocita di sedimentazione e massa globulare negli aborti incompleti seguiti da revisione della cavita uterina. Valore diagnostico e prognostico del decorso puerperale abortivo.)

By A. De Marchi. *Arch. Ostet. Ginec.*, **52**, 361–371, Nov.–Dec., 1947. 2 figs., 29 refs.

This paper, read at the Obstetrical and Gynaecological Congress in Florence, in November 1946, is based on investigations carried out at the Obstetrical and Gynaecological Clinic of the University of Padua. Its scope is indicated by its title.

A hundred cases of incomplete abortion, subdivided into febrile and afebrile groups, and 22 control cases of complete, spontaneous and afebrile abortion were compared with each other. The tests mentioned in the title were performed: (1) on admission to hospital; (2) two days after surgical evacuation of the uterus; and (3) two days later. [For details of the figures obtained the original article must be consulted.]

The author arrives at the following conclusion. In spontaneous complete and incomplete abortions the erythrocyte sedimentation rate (E.S.R.) is higher than in women who are not pregnant or are in early pregnancy. In the post-abortive period, study of the E.S.R., together with the leucocyte count and estimation of the erythrocyte volume, and sometimes also with the Takata-Ara reaction, will demonstrate the presence of a complication. The E.S.R. represents a diagnostic and prognostic aid superior to all the other tests employed and, while not absolutely specific, may be valuable as a test in ambulatory patients. *N. Alders*

1089. **Deaths Following Use of Abortifacient Paste. Report of Two Cases.**

By W. Kulka. *Amer. J. clin. Path.*, **17**, 723–727, Sept. 1947. 2 figs., 9 refs.

The necropsy findings are described in 2 patients in whom death followed the injection of an abortifacient paste. In 1 patient, death occurred 2½ months after the attempted abortion. Necrosis of the uterine wall, parametrial abscesses, and generalized peritonitis were found. The second patient died suddenly of pulmonary embolism within a few hours after an attempt to cause abortion by intrauterine injection of the paste. The emboli were composed of fatty material and particles from the damaged chorionic villi. There was necrosis of some of the villi and vessels of the uterine wall, but no apparent changes in the embryo or the embryonic sac. The presence of a pasty material was demonstrated by the technique used routinely for the demonstration of fat, but the staining reaction was different from that of fat.—[Author's summary.]

1090. **Peritonitis after Abortion.** (Nuevas consideraciones sobre peritonitis post-aborto.)

By G. Villavicencio. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 212–221, Sept. 1947. 12 refs.

1091. **The Placental Site in Vesicular Mole.** (Il situs placentaris nella mola vescicolare semplice.)

By L. De Giorgi. *Arch. Ostet. Ginec.*, **52**, 321–339, Nov.-Dec., 1947. 5 figs., 11 refs.

The author reports in detail on 4 cases of vesicular mole, observed at the Obstetrical-Gynaecological Clinic of the University of Naples between 1925 and 1945.

At varying intervals after spontaneous expulsion of the mole (2, 15, 36, and 37 days respectively), subtotal or total hysterectomy and excision of both appendages were performed and the placental site was examined macroscopically and histologically. [The reason for this rather drastic operative interference is not stated in the first two patients, one of whom was only 20 years old, but appears to have been moderate haemorrhage in the remaining two cases. The Friedman reaction was repeatedly negative in one of these.] Macroscopical investigation showed that the placental site was still recognizable 15 days after expulsion of the mole, but no trace of it could be found after 36 days. Histologically, there was an abundance of trophoblastic elements, situated in the decidua and in the superficial layers of the myometrium, and already some necrosis and lymphocytic infiltration, 2 days after expulsion of the mole.

After 15 days there were signs of regeneration of the mucous membrane, of more regression and necrosis of trophoblastic elements, which were still present in small accumulations, and of more small-celled infiltration. The ectodermal elements survived for a long period, being recognizable in groups, situated invariably between the (fully regenerated) mucous membrane and the myometrium and surrounded by lymphocytes, leucocytes, and fibroblasts, as late as 37 days after expulsion of the mole. *N. Alders*

1092. **Lesions of the Cervix in Relation to Pregnancy.**

By G. Hill. *Med. Press*, **219**, 335–337, April 14, 1948.

1093. **Pregnancy and Fibroids.** (Grossesse et fibromes.)

By G. Geeraert and R. Voker. *Brux méd.*, **28**, 765–777, Apr. 11, 1948. 4 figs., Bibliography.

1094. **Factors in the Treatment of Chorion-epithelioma.**

By A. W. Holman and E. H. Schirmer. *Amer. J. Obstet. Ginec.*, **55**, 629–635, Apr. 1948. 12 refs.

1095. **Chorioncarcinoma.**

By P. Pernworth. *Amer. J. Surg.*, **75**, 521–523, Mar. 1948. 2 refs.

1096. **A Rare Case of Hypertrophy of the Breast during Pregnancy.** (Rzadki przypadek przerostu sutków w przebiegu ciazy.)

By A. Ber and I. Herbstowa. *Polsk. Tyg. lek.*, **2**, 1057–1061, Sept. 1947. 4 figs., 22 refs.

A woman, aged 25, was admitted to hospital during the second month of pregnancy on account of the enormous enlargement of her breasts. The right breast had a circumference of 60 cm., and the left breast of 56 cm. The breasts had been gradually increasing in size since the beginning of pregnancy. Possible causes of the unusual hypertrophy were considered: (1) excessive production of oestrogenic hormone or of progesterone; (2) exceptional response of the gland tissue of the breast to the stimulation of the hormones. Three kinds of treatment were tried. First, large doses of progesterone were given as an antidote to the oestrogenic hormones, then large doses of oestrone were administered as an antidote to the progesterone, and finally X-ray irradiation of the breast was carried out in the hope of lessening the response to hormone stimulation. None of these treatments was successful. Because of the continuing enlargement of the breasts the pregnancy was terminated at the fourth month. The breasts then diminished in size somewhat, but as they became enlarged and painful during every menstrual period, partial amputation was advised.

C. Uhma

1097. **Weakness of the Lower Extremities as a Complication of Pregnancy.**

By H. W. Neumann. *Cincinatti J. Med.*, **29**, 149–162, Mar. 1948. 23 refs.

1098. **Vitamin B_1 Deficiency in Pregnancy and Icterus Neonatorum.** (Vitamin-B_1-mangel während der Schwangerschaft und Icterus der Neugeborenen.)

By A. Cattori. *Praxis*, **37**, 229–231, Apr. 1, 1948.

1099. **Heart Disease and Pregnancy.**

By J. A. Hardy. *Mississippi Valley Med. J.*, **70**, 49–52, Mar. 1948. 2 refs.

1100. **Pregnancy and Coronary Insufficiency.** (Schwangerschaft und "Coronarinsuffizienz".)

By H. Siedek and R. Wenger. *Wien. klin. Wschr.*, **59**, 696–700, Oct. 24, 1947. 2 figs., 63 refs.

Between July 1946 and May 1947, 532 pregnant women were studied electrocardiographically and changes typical of coronary insufficiency were found in 73. Of the entire series there were no grounds in 490 patients for anticipating such a finding, yet 59 (12 per cent) of these showed abnormal changes. The changes were particularly found in the second and third months of pregnancy, practically never in the fourth and fifth months; they became commoner again late in pregnancy. It is suggested that the presence of coronary insufficiency early in pregnancy implies that the heart has not yet adapted itself to its extra load. The condition is not an indication for interrupting pregnancy. *S. S. B. Gilder*

1101. **Complete Heart Block in a Case of Pregnancy.**
By R. M. BARTON and C. N. LADUE. *Amer. J. Med.*, **4**, 447-451, Mar. 1948. 2 figs., 16 refs.

1102. **Full-term Pregnancy with Syncopal Attacks in Dorsal Position.** (Fullgatt svangerskap med synkoptiske anfall i ryffleie.)
By N. CLEMETSEN. *Nord. Med.*, **37**, 422-424, Feb. 27, 1948. 2 figs., 4 refs.

1103. **Significance of the Rh Factor in Obstetrics.** (Die Bedeutung des Rhesusfaktors für die Geburtshilfe.)
By M. A. FRELIN VON FINCK. *Z. Geburtsh. Gynäk.*, **129**, 1-22, 1948. 16 figs., 26 refs.

1104. **Leukaemia and Pregnancy.** (Leucemia e gravidanza.)
By G. LUGO. *Mon. ostet.-ginec.*, **18**, 213-237, July-Dec. 1947. 1 fig., Bibliography.

1105. **Electroshock Treatment in Pregnancy.** (Electroshocktherapie en zwangerschap.)
By A. M. PLENTER. *Ned. Tijdschr. Geneesk.*, **92**, 1079-1082, Apr. 10, 1948.

1106. **Right Hemiplegia and Aphasia at Term.** (Sindrome de hemiplejia derecha y afasia al final de gestación.)
By B. GUILERA MOLAS. *Med. esp.*, **19**, 3-6, Jan. 1948.

1107. **Observations on Pseudocyesis during the Late War.** (Beobachtungen über eingebildete Schwangerschaft während des letzten Krieges.)
By R. K. KEPP. *Dtsch. med. Wschr.*, **73**, 120-122, Mar. 12, 1948. 4 refs.

1108. **Pregnancy in the Diabetic.**
By L. J. PALMER, J. H. CRAMPTON and R. H. BARNES. *West J. Surg. Obstet. Gynec.*, **56**, 175-177, Mar. 1948. 5 refs.

1109. **Diabetes and Pregnancy.** (Diabetes e gravidez.)
By G. FRIOZZI. *Rev. Ginec. Obstet.*, **42**, 210-214, Mar. 1948. 2 refs.

1110. **Diabetes in Pregnancy.**
By R. A. REIS. *J. Iowa med. Soc.*, **38**, 41-45, Feb. 1948.

1111. **Pregnancy Complicating Tuberculosis. A Survey for an Eleven-year Period.**
By C. J. BARONE, J. A. FINO and L. H. HETHERINGTON. *Amer. J. Obstet. Gynec.*, **54**, 475-487, Sept. 1947. 1 fig.

During the 11 years from January 1930 to January 1941, 28,846 patients were delivered at the Elizabeth Steel Magee Hospital, Pittsburg. Of these, 103 (0.35 per cent) were known to have pulmonary tuberculosis, but the records of 41 patients were incomplete. A clinical survey for a period of 5 to 15 years was made on the remaining 62 patients. The mortality rate in the series was 33.8 per cent, when corrected by the exclusion of 2 deaths (1 of proved tertiary syphilis, and 1 of collapse during thoracoplasty), the mortality rate was 30.6 per cent. The mortality rate was 19.2 per cent among those delivered spontaneously, 36.3 per cent when delivery had been by Caesarean section, and 38.5 per cent where pregnancy had been terminated in the first trimester. Moderately or greatly advanced activity of the disease was present in 61.5 per cent of the 62 patients, and 44.8 per cent of these are dead. The best results were obtained in patients delivered spontaneously, irrespective of the extent of the tuberculosis.

Anthony W. Purdie

1112. **Child-bearing and Pulmonary Tuberculosis.**
By C. J. STEWART and F. A. H. SIMMONDS. *Brit. med. J.*, **2**, 726-729, Nov. 8, 1947. 16 refs.

In January 1944 the authors decided to keep a central register of pregnancies in women attending chest clinics in the county of Middlesex in order to determine what influence, if any, child-bearing has upon the course of pulmonary tuberculosus disease. The influence of "infant-rearing"—the extra effort needed after the birth of the child—was not considered.

The population of the county was estimated at 1,900,000, and in 1944 there were 4,200 tuberculosis females of child-bearing age on the chest-clinic registers. Up to June 1946, 236 of these females became pregnant. From all the married women of child-bearing age on the registers of two Middlesex clinics, 321 who had had no pregnancy between January 1943 and June 1946 were used as a control group. Of the pregnant patients, 50 (21.2 per cent) were considered to have active or progressive disease; while in the control group 114 (35.5 per cent) had the same degree of activity; 166 (70.3 per cent) of the pregnant cases, and 125 (38.9 per cent) of the non-pregnant controls were considered to have quiescent or arrested disease. For various reasons, records were inadequate in respect of the remaining cases and controls. The state of the disease was assessed at the beginning of pregnancy, or as regards the controls as near to January 1944 as possible, and compared with the state 12 to 15 months later. The pregnant patients were separated into those that went to term and those in whom the pregnancy was surgically terminated.

Tables are given showing the striking similarity of the results in the pregnant and non-pregnant groups, both with active and non-active disease. Of 50 pregnant and 114 non-pregnant women with active disease, signs and symptoms became quiescent in 35 per cent of each group; 30 to 40 per cent deteriorated or died. Of the non-active cases, comprising 166 pregnant and 125 non-pregnant women, the condition deteriorated in 8 to 12 per cent of each group, but there were no deaths. Patients whose pregnancy was artificially ter-

minated fared no better than those allowed to continue to term. All the cases and controls were carefully analyzed for: (1) age, (2) social class, (3) number of previous pregnancies, (4) duration of the disease, and (5) activity or quiescence of the disease. The authors show statistically that in those with active disease there was no significant difference between cases and controls under headings (1), (2), (3), or (4), but that in the quiescent group the age-composition as between the pregnant cases and the non-pregnant controls was different. There was a larger proportion of women under 30 amongst the pregnant.

The authors conclude that pregnancy has little or no effect on the progress of active or quiescent pulmonary disease over a period of 15 months, and that there is no evidence that surgical termination of pregnancy is necessary except in a few selected cases. *R. J. Lumsden*

1113. **Further Development of Pulmonary Tuberculosis after Childbirth.** (Evolución de la tuberculosis pulmonar después del parto.)

By V. M. Aviles, F. Rodriguez and J. Oneto. *Obstet. Ginec. lat.-amer.*, **5**, 273–298, July 1947. 8 figs., 17 refs.

After reviewing the widely varying views in the literature on the effect of pregnancy on tuberculosis, the authors describe, with full clinical details, a series of cases seen in Santiago. Tuberculosis was diagnosed in 658 of 32,953 obstetrical cases, an incidence of 1.99 per cent. Eighteen patients out of the 658 died as a result of tuberculosis; this mortality rate of 2.75 per cent is considered low in view of the serious prognosis hitherto in cases where these two conditions are associated. A detailed study was made of 43 cases for periods varying between 3 months and 2 years or more. In 28 per cent of these, the disease was aggravated, in 30 per cent there was no change, and in 42 per cent there was improvement. The corresponding figures in 31 cases in which therapeutic abortion was carried out were 42, 29, and 29 per cent. In 10 cases of productive tuberculosis there was an aggravation in 10 per cent, no change in 60 per cent, and improvement in 30 per cent. In 12 cases of exudative tuberculosis the corresponding figures were 58, 8, and 33 per cent, and in 21 cases with mixed lesions, 19, 28, and 52 per cent. Study of the results according to the extent of the lesions showed that there was aggravation in 50 per cent with advanced lesions, in 26.66 per cent with moderate lesions, and in 20 per cent with minimal lesions. There was improvement in 37.51 per cent with advanced lesions, in 46.66 per cent with moderate lesions, and in 40 per cent with minimal lesions. Patients between the ages of 25 and 35 are those most likely to suffer from aggravation of the condition, and the risk of this is also greater in multiparae than in primiparae. Rest, sanatorium treatment, and modern surgical methods have contributed to the good results. *Bryan Williams*

1114. **Bilateral Renal Tuberculosis in Pregnancy.**

By H. R. Newman and H. Levine. *Connecticut med. J.*, **12**, 119–120, Feb. 1948. 6 refs.

1115. **Tuberculosis and Pregnancy.** (Tuberculose e gravidez.)

By A. De Paula and R. G. Simonard Santos. *Rev. méd. munic.*, **11**, 125–158, Oct.–Dec., 1947. 33 figs., 16 refs.

1116. **Rubella in Pregnancy and Congenital Deformities in the Child.** (Rubeola under graviditet och kongenitala missbildningar hos barnet.)

By M. Zewi. *Nord. Med.*, **37**, 416–418, Feb. 27, 1948. 23 refs.

1117. **A Case of Foetus Pseudo-amorphus.**

By J. Svejda. *J. Path. Bact.* **59**, 647–655, Oct. 1947. 5 figs., 19 refs.

1118. **Twin Pregnancy with Hydramnios in One Amniotic Sac: Radiological Diagnosis.** (Embarazo gemelar con polihidramnios de uno de los huevos. Contribucion a su diagnóstico radiológico.)

By J. Leon. *Sem. méd.*, **55**, 414–417, Mar. 11, 1948. 1 fig.

1119. **Radiographs of an Anencephalic with Spina Bifida** *in Utero.* (Radiographies d'anencéphale presentant un spina-bifida *in utero.*)

By —. Cleisz and —. Bret. *Gynec. et Obstet.*, **47**, 177, 1948. 2 figs.

1120. **Diagnosis of Foetal Ascites in Pregnancy.** (Diagnóstico de la ascitis fetal durante el embarazo.)

By P. Puig y Roig. *Med. esp.*, **19**, 117–123, Jan. 1948. 2 figs.

1121. **Early and Late Ectopic Pregnancy.**

By F. E. Whitacre and H. D. Lynn. *J. Michigan med. Soc.*, **47**, 285–288 and 338, Mar. 1948.

1122. **The Diagnosis and Treatment of Ectopic Pregnancy.**

By H. H. Ware. *West Virginia med. J.*, **44**, 49–52, Mar. 1948. 13 refs.

1123. **Recurrent Extrauterine Pregnancy.** (Considerazioni sulla gravidanza extrauterina recidivante.)

By M. Bertani. *Mon. ostet.-ginec.*, **18**, 190–210, July–Dec. 1947. 4 figs., 23 refs.

1124. **A Case of Extra-uterine Pregnancy Going to Full Term.**

By R. L. Paterson and H. Currie. *S. Afr. med. J.*, **22**, 229–230, Mar. 27, 1948.

1125. **Observations on Thirteen Cases of Late Extrauterine Pregnancy.**

By H. H. Ware. *Amer. J. Obstet. Gynec.*, **55**, 561–582, Apr. 1948. 18 refs.

1126. **Chemical Diagnosis of Extrauterine Pregnancy.** (Die chemische Diagnose der Extrauterinschwangerschaft.)
By D. STUCKI. *Gynaecologia, Basel*, **125**, 44–47, Jan.-Feb., 1948.

1127. **Simultaneous Intra-uterine and Extra-uterine Pregnancy.**
By R. W. DEVOE and J. H. PRATT. *Proc. Mayo Clin.*, **23**, 166–168, Mar. 31, 1948. 3 refs.

1128. **A Case of Cervical Pregnancy at Term.** (Un caso de embarazo cervical a término.)
By R. FUSTER CHINER and J. A. QUERALT BALLESTER. *Med. esp.*, **19**, 82–88, Jan. 1948. 16 refs.

1129. **Secondary Abdominal Pregnancy with Survival of the Foetus and Mother.**
By G. H. MOORE. *Med. J. Aust.*, **1**, 405–407, Mar. 27, 1948. 1 ref.

1130. **Abdominal Pregnancy with Report of Two Cases.**
By F. E. HAGIE. *J. Indiana med. Ass.*, **41**, 305–307, Mar. 1948. 3 figs.

1131. **Full Term Intra-abdominal Ectopic Pregnancy.** (Surgical Treatment of Five Cases.)
By C. BOWESMAN and A. H. CHENARD. *Irish J. med. Sci.*, 132–136, Mar. 1948. 1 fig., 3 refs.

1132. **Abdominal Pregnancy at Term Secondary to Uterine Rupture.** (Embarazo abdominal a termino secundario a rotura uterina.)
By F. P. ACOSTA. *Rev. méd. quirúrg. Oriente.*, **8**, 212–216, Dec. 1947. 3 refs.

1133. **Unruptured Primary Ovarian Pregnancy.**
By S. S. WITTENBERG and R. G. RIES. *Amer. J. Surg.*, **75**, 618–623, Apr. 1948. 2 figs., 39 refs.

1134. **Two Cases of Primary Ovarian Pregnancy.** (Due casi di gravidanza extra-uterina primitiva ovarica.)
By M. OPOCHER. *Mon. ostet.-ginec.*, **18**, 269–280, July–Dec. 1947. 4 figs., 19 refs.

1135. **Endometrioid Changes and Decidual Reaction in the Pathogenesis of Tubal Pregnancy.** (Metamorfosi endometrioide e reazione deciduale nel meccanismo patogenetico della gravidanza tubarica.)
By S. VALENTI. *Ginecologia, Torino*, **14**, 65–91, Feb. 1948. 4 figs., Bibliography.

1136. **Interstitial Pregnancy.** (Interstitiel graviditet.)
By N. CLEMETSEN. *Nord. Med.*, **37**, 403–404, Feb. 27, 1948. 17 refs.

LABOUR.

1137. **The Key to Painless Childbirth.**
By G. REES. *S. Afr. med. J.*, **22**, 210–213, Mar. 27, 1948.

1138. **A Study of the Perineum in Labour.** (Contribuição ao estudio do períneo no parto.)
By L. RODRIGUES DE LIMA GOUVEA. *Arch. brasil. Med.*, **37**, 269–337, Oct.-Dec., 1947. 40 figs., Bibliography.

1139. **Cholinergy in Labour and the Puerperium.** (Colinergia e stato puerperale.)
By L. NOBILI. *Riv. ital. Ginec.*, **31**, 198–204, 1948. 7 refs.

1140. **Graphic Registration of Uterine Contraction in Three Labours Induced Near Term.** (Enregistrements graphiques de la contraction uterine au cours de trois accouchements provoqués au voisinage du terme.)
By H. PIGEAUD and L. BARÉ. *Gynécologie*, **44**, 265–268, Sept.-Oct. 1947. 3 figs.

1141. **Elective Induction of Labor.**
By R. M. GRIER. *Amer. J. Obstet. Gynec.*, **54**, 511–516, Sept. 1947. 4 refs.

The incidence of induction of labour at the Evanston Hospital was 10.9 per cent from 1935 to 1940 and 14.4 per cent from 1940 to 1945. Because of this increase the author decided to make a detailed study of the effects of induction during 1 further year. [These results cannot usefully be compared with those published in Britain, as they were obtained from the "precipitation of imminent labour" in a selected series of women.] Of the 129 inductions (10 per cent of all deliveries) only 6 were therapeutic—4 for severe toxaemia and 2 for marginal placenta praevia. The others were particularly favourable cases, in that there was no cephalo-pelvic disproportion, the head was engaged or dipping into the pelvis, the baby was mature and presented by the vertex, and the cervix was soft, partially effaced, and dilated to at least 1 cm.; in 62 cases the cervix was moderately to completely effaced and more than 1 cm. dilated. Only one induction failed, and only 5 were associated with morbidity. There were 1 macerated stillbirth and 1 neonatal death from atelectasis. The latent period from rupture of membranes to onset of pains averaged 4 hours ± 29 minutes in primigravidae and 55 minutes ± 5 minutes in multigravidae. The corresponding figures for length of labour were 6 hours 56 minutes and 4 hours 8 minutes respectively. Both latent period and length of labour were much diminished in the 62 women whose cervices were more than 1 cm. dilated, and in the 51 women in whom the head was less than 1 cm. above the ischial spines. Posterior positions of the occiput did not appear to influence induction time or length of labour.

When the conditions described above are found by rectal examination the patient is offered elective induction of labour. After an enema 10 ml. of 10 per cent calcium gluconate is given intravenously, and within 2 hours the membranes are ruptured below the head. If labour has not begun

in 2 hours, 1-minim doses of pitocin are given intramuscularly at ½- to 1-hour intervals. Castor-oil and quinine have been abandoned. The calcium gluconate is thought to raise the ratio of ionized to non-ionized calcium and so to increase uterine contractility. *Aileen Dickins*

1142. **Induction of Labor at the Chicago Lying-in Hospital.**

By W. J. DIECKMANN and R. B. MCCREADY. *Amer. J. Obstet. Gynec.*, **54**, 496–510, Sept. 1947. 25 refs.

Since 1933 the authors have tried to reduce maternal and foetal mortality by progressively limiting the number of inductions of labour and attempting to select the optimum time for them. They no longer induce labour for post-maturity and contracted pelves, and do so much less often for toxaemia. Their indications now include placenta praevia (when it is not total and there is some cervical dilatation), accidental haemorrhage, eclampsia (after 4 to 6 hours' medical treatment, and where there is some cervical dilatation), severe toxaemia, some cases of cardiac disease, pulmonary tuberculosis, anaemia, diabetes, habitual intrauterine death of the foetus, hydramnios, and twin pregnancy. They are opposed to induction of labour for the convenience of doctor or patient. Patients whose membranes have ruptured prematurely are given pituitary extract only if the cervix is " ripe ".

When induction of labour is contemplated a vaginal examination is made to determine the condition of the cervix, pelvis, and presenting part, and to exclude prolapse of cord. If the cervix is ripe (that is, effaced with the margins 0.4 to 1 cm. thick and soft in a primigravida or 2 cm. dilated in a multipara) the membranes are stripped as high as possible. The following morning, after an enema, pituitary extract is given, or the membranes are ruptured below the head or a bag is inserted. These are the only methods employed. Pituitary extract (preferably " pitocin ") is given in doses of ½ unit, 1 unit, 2 units, 3 units, and 3 units at 20-minute intervals. Each dose is given only if contractions are absent or weak, and the drug is used either alone or 8 to 12 hours after artificial rupture of the membranes if contractions have not begun.

During 30 months, induction was attempted in 7.3 per cent of all deliveries; over the same period there were 4 per cent Caesarean sections. Of the iinductions 9 per cent failed. Five Caesarean sections were performed on the failures. There were 2 maternal deaths in the 276 cases in which induction was successful—1 due to accidental haemorrhage, cortical necrosis of the kidney, necrosis of the pituitary, and eclamptic liver changes, and and the other due to a ruptured uterus produced during delivery of an impacted shoulder. There were 17 foetal deaths. The maternal morbidity was 14.7 per cent, compared with an average hospital morbidity of 9 per cent. The average latent period between induction and the onset of labour varied from 1.5 to 7.7 hours. The average length of labour was also short, and the authors gained the impression that labour after artificial rupture of the membranes was shorter than after spontaneous rupture.

[The authors do not state what is done when termination of pregnancy is clearly and perhaps urgently indicated but the cervix is not ripe. Presumably the induction is delayed or a Caesarean section performed. A discussion on this troublesome type of case would have been valuable.] *Aileen Dickins*

1143. **Induction of Labor.**

By H. GUYOT. *Manitoba med. Rev.*, **28**, 179–183, Apr. 1948.

1144. **The Management of Difficult Labor.**

By T. K. BROWN. *Nebraska St. med. J.*, **33**, 3–7, Jan. 1948. 12 refs.

1145. **Septate Vagina as a Cause for Dystocia in Labor.**

By W. J. REICH and M. J. NECHTOW. *J. Lancet*, **68**, 66–67, Feb. 1948. 1 fig., 10 refs.

1146. **Effect of Intravenous " Spasmalgine " on Uterine Contraction and the Course of Labour in the Primipara.** (Action de la spasmalgine intraveineuse sur la contraction utérine et la marche du travail chez la primipare.)

By H. PIGEAUD and A. NOTTER. *Gynéc. et Obstét.*, **47**, 60–65, 1948. 1 fig., 9 refs.

1147. **Protrusion of the Acetabula as Complication of Labor.** [In English.]

By J. PETERSEN. *Acta radiol., Stockh.*, **29**, 205–214, Mar. 1948. 3 figs., 12 refs.

1148. **Dystocia due to a Double Monster.** (Distocia por monstruo doble. Caso clínico.)

By C. THONET. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 221–225, Sept. 1947. 1 fig.

1149. **Transverse Lie.** (Sobre presentación de tronco.)

By M. VASQUEZ ZUNIGA. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 236–246, Oct. 1947. 2 figs.

1150. **Primary Face Presentation.**

By S. BRODY. *New York St. J. Med.*, **48**, 525–526, Mar. 1, 1948. 3 figs., 3 refs.

1151. **More Experiences with Bracht's Method in Breech Delivery.** (Mayor experiencia con la maniobra de Bracht en la atención del parto pelviano.)

By A. GONZÁLEZ COLLAZO and N. O. DI FONZO. *Prensa méd. argent.*, **35**, 323–325, Feb. 20, 1948. 1 fig., 12 refs.

1152. **Prophylactic Intrapartum and Postpartum Intravaginal Sulphonamide Therapy.** (Sulfamido-

terapia vaginal. Intra y post-partum profilactica de la infeccion puerperal.)

By J. LEON. *Rev. Ginec. Obstet.*, **1**, 142–149, Feb. 1948. 2 figs.

1153. **Manual Removal of the Placenta. A Report of 410 Cases of Manual Removal of the Placenta with One Death; 150 of the Cases were done as a Routine or Prophylactic Measure.**

By H. W. MAYES. *West. J. Surg. Obstet. Gynec.*, **55**, 483–490, Sept. 1947. 11 refs.

In 12½ years at the Methodist Hospital, Brooklyn, New York, out of a total of 22,264 vaginal deliveries there were 260 cases of manual removal of the placenta. There was only 1 death, a mortality rate of 0.4 per cent. The corrected morbidity rate was 9.2 per cent. In the majority of these cases there had been repeated attempts at expression by the Credé method, after which manual removal was undertaken, usually within 20 to 30 minutes. Of these 260 patients 151 had had spontaneous deliveries and 109 operative (88 low forceps, 12 mid-forceps, and 9 bag inductions). There were 100 primiparae and 160 multiparae in the series.

The excellent results obtained suggested to the author a controlled study of early manual removal of the placenta, and he reports on 234 personal cases with 150 manual removals over a period of 10 months. The majority of the manual removals were carried out within 4 minutes of delivery. There were no deaths in the series and the morbidity rate was 2 per cent, corrected to 0.66 per cent. In all these cases, as in the previous 260, vaginal antisepsis had been employed before and during delivery. This technique of vaginal antisepsis, which involves the frequent treatment of the perineum and vagina with 2 per cent "mercurochrome", is described in detail; before manual removal of the placenta further antiseptic precautions are taken by the use of 2 per cent acetone-alcohol solution of mercurochrome and 2 per cent mercurochrome in glycerin. Of the 150 cases there was spontaneous delivery in 33 and operative delivery in 119 (75 prophylactic, 33 low-, 8 mid-, and 1 high-forceps).

The series was divided into three groups, each of 50 cases. In Group 1, 10 units of pituitrin was given intramuscularly immediately after delivery and gr. $\frac{1}{200}$ (0.2 mg.) of "ergotrate" (ergometrine) intramuscularly after delivery of the placenta. In Group 2, gr. $\frac{1}{200}$ ergotrate was given intravenously on delivery of the child. In Group 3, no oxytocic was used until delivery of the placenta, when 10 units of pituitrin were given intramuscularly and about 10 minutes later gr. $\frac{1}{200}$ (0.2 mg.) ergotrate intramuscularly. A comparison of the three groups showed that in Groups 1 and 2 separation of the placenta occurred more easily. Intravenous ergotrate before delivery of the placenta (Group 2) seemed to produce a more rapid separation of the placenta than intramuscular pituitrin given at the same time (Group 1). Blood loss was less when oxytocics were used. In Group 3 it was found advisable to wait 5 minutes after delivery before manual removal was attempted, as bleeding was greater if removal was attempted earlier.

The author considers that his figures should encourage manual removal when a difficult third stage is expected, but remarks that where vaginal antiseptics are not used routinely sulphonamides and penicillin should be given. Manual removal of the placenta is not recommended as a routine procedure. *E. L. Nicholson*

1154. **The Placental Stage and Postpartum Hemorrhage.**

By W. J. DIECKMANN, L. D. ODELL, V. M. WILLIGER, A. G. SESKI, and R. POTTINGER. *Amer. J. Obstet. Gynec.*, **54**, 415–427, Sept. 1947. 4 figs., 39 refs.

In the management of the third stage of labour the authors have investigated the technique advocated by Davis and Boynton (*Amer. J. Obstet. Gynec.*, 1942, **43**, 775) in which intravenous administration of "ergotrate" (ergometrine maleate) is advised at the time of delivery of the anterior shoulder, followed by a pause of 30 seconds in the delivery of the trunk, intended to allow time for the ergotrate to act. Davis and Boynton found with this technique that the placenta could be expressed within 3 minutes in 72 per cent of cases. These findings have been fully confirmed by the present authors, but they had results almost equally favourable after the administration of "ergotrate", of posterior pituitary extract, and of normal saline. They therefore concluded that the major factor in the short third stage was the pause of 30 seconds, and began an investigation into the effects of delivering the anterior shoulder, waiting 30 seconds, delivering the posterior shoulder, injecting 1 ml. of unknown solution, waiting 30 seconds, and then slowly delivering the baby. In primigravidae the average time occupied in the delivery of the trunk of the child has been 3¼ minutes. In 90 per cent of cases delivery of the placenta was completed within 3 minutes of the birth of the child. Again there was no substantial difference in regard to duration of third stage between the groups to whom ergotrate, pituitrin, or normal saline was administered, but heavier third stage and postpartum bleeding were observed in the group given normal saline. They believe this may be attributable to the high proportion of deliveries under anaesthesia, and state that an oxytocic is essential in such circumstances. They have found 1 unit of posterior pituitary extract to be more effective than 0.2 mg. of ergotrate. The effect of larger doses of ergotrate is now being investigated. If it proves impossible to deliver the placenta by compression of the uterus (with cord traction when the placenta enters the vagina) the authors believe

that little is to be gained from waiting for placental separation, and standard instructions to their resident staff are " to remove the placenta manually within 1 hour at a maximum, and usually within 15 minutes after delivery ". These instructions apply only to retained placenta without haemorrhage. The occurrence of any significant third-stage haemorrhage is an indication for removing the placenta at once.

In the management of haemorrhage after the third stage the authors advocate repetition of the intravenous injection of the original oxytocic; inspection of the vulva, vagina, and cervix; manual exploration of the uterus for accessory placental lobule, tumours, or ruptured uterus; massage of the uterus through the abdominal wall; and, if haemorrhage then continues, packing of the uterus. Appropriate transfusion measures are required. The authors discount the dangers of " pituitary shock " in the dosage which they have employed.

[It is difficult to pick out from the tables the numbers of patients actually involved, while there is no mention of critical statistical analysis. The graphic figures are complicated, and not sufficiently detailed to repay the close study which they demand if they are to be intelligible. The paper indicates an aggressive attitude towards the management of the third stage which is unlikely to commend itself to the British practitioner. Nevertheless, the records of the Chicago Lying-in Hospital challenge comparison with any others, and it is clear that the incidence of postpartum haemorrhage has fallen to an extraordinarily low level (0.35 per cent in 1,159 cases during 1946). It is true that many British hospitals, with a conservative management, record figures almost as low (for example, Simpson Memorial Maternity Pavilion Reports show an incidence of 0.39 per cent over 9,533 deliveries in 1943-44-45), but these figures are not based upon such strict criteria as those applied in the Chicago study, and the magnitude of the authors' achievement should not be minimized. The omission of bimanual compression of the uterus in the treatment of postpartum haemorrhage is surprising, while the advocacy of the use of an intrauterine pack should have been tempered with warning of its dangers and reasons for its occasional failure to control bleeding in the completely atonic uterus.] *W. I. C. Morris*

1155. **Method of Treating Massive Obstetric Hemorrhage.**

By J. T. Cole. *J. Amer. med. Ass.*, **135**, 142-144, Sept. 20, 1947. 6 figs., 4 refs.

This paper describes the method of blood replacement as practised at the Women's Clinic of the New York Hospital. In massive haemorrhage the basis of any successful treatment depends upon the rapid control of haemorrhage by the method causing least trauma, followed by restoration of the blood volume by the intravenous administration of either blood or plasma, preferably the former. When blood loss is not checked quickly then haemorrhagic hypotension may progress rapidly to irreversible shock from which recovery is impossible. An effective plan of treatment is outlined. As a prophylactic measure typing of the blood of all pregnant women during the antenatal period is recommended. If for obstetrical reasons such as hydramnios, fibromyoma uteri, manual removal of the placenta, or difficult forceps delivery, haemorrhage can be anticipated, a preliminary cross-grouping should be carried out. A further safeguard, which the author now practises in Caesarean section, is to administer sixth-molar sodium lactate solution by the intravenous route at the time the operation is begun so that if the need arises blood can be substituted without delay. He now uses sixth-molar sodium lactate solution in preference to dextrose and isotonic solutions of sodium chloride in the belief that alkaline agents are useful in delaying the onset of irreversible shock until blood or plasma is available. Furthermore, alkalies will combat transfusion reactions.

By a series of graphs the author illustrates the importance of the time factor. From his studies he suggests a 40 per cent replacement of total blood loss during the first hour after the initial haemorrhage. Rapid treatment should not be stopped until there has been a definite response in the blood pressure. Thereafter blood should be given by the usual procedure until there has been 100 per cent or more replacement. The rapid replacement suggested is not possible by the drip method; consequently during the past 3 years the author had added a simple pressure mechanism to the ordinary transfusion apparatus. Two flasks containing citrated blood and sixth-molar sodium lactate solution respectively are connected by a Y-tube to a combined drip and filter chamber. To the air intake of the blood bottle a tube is attached, to which a Y-tube connects a sphygmomanometer bulb and an aneroid meter. Raising the pressure in the bottle of citrated blood to 120 mm. Hg enables 500 ml. of blood to be given quite rapidly (in 7 to 10 minutes with an 18-gauge needle and in 2 to 5 minutes with a 15-gauge needle).

During the time these methods have been in use there have been no deaths in 7,500 major and minor gynaecological procedures; only 1 death was due to haemorrhage in 14,000 deliveries, included in which were 250 postpartum haemorrhages (600 ml. or more blood loss).

R. L. Hartley

1156. **Haemorrhages in and after the Placental Stage of Labour, their Incidence and Prevention.** (Blödningar under och efter efterbords-skiftet, deras frekvens och profylax.)

By H. Sauramo. *Nord. Med.*, **37**, 399-403, Feb. 27, 1948. 15 refs.

1157. **Insuperable Postpartum Inertia Due to Haemorrhage into the Uterine Wall.** (Consideraciones sobre inercia irreductible post parto por apoplejia uterina.)

By L. TISNE BROUSSE. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 246–252, Oct. 1947. 1 fig.

1158. **Replacement of an Inverted Uterus with Intravaginal Packing.**

By L. S. LOIZEAUX. *Bull. N.Y. med. Coll.*, **10**, 53–56, 1947. 1 ref.

1159. **Uterine Inversion.** (Inversión uterina.)

By J. GENATO MUNIZ. *An. Med. Cirug.*, **23**, 81–85, Feb. 1948.

1160. **Treatment of Complete Uterine Rupture during Labour.** (Le traitement curatif des ruptures utérines complètes au cours du travail.)

By R. MERGER, —. HERVÉ, and —. LELIÈVRE. *Paris méd.*, **38**, 129–132, Mar. 13, 1948.

1161. **Shock in Obstetrics.**

By W. A. SCOTT. *Brit. med. J.*, **2**, 647–649, Oct. 25, 1947.

It is of little importance whether there is a special kind of shock, called " obstetric shock ", occurring in normal women after normal labour. A number of maternal deaths were formerly attributed to this cause, but many authorities now believe that in the majority of cases, if not at all, necropsy will reveal some condition sufficient to account for the fatality.

Analysis of 82 maternal deaths in which there was clinical evidence of shock showed that in only 11 of the cases were there no definite lesions accounting for the shock; of these version was performed in 5, after failed-forceps. The author believes that from a clinical viewpoint most cases of obstetric shock can be evaluated in terms of haemorrhage. Other causes of shock may occur in parturient women, but they are relatively infrequent. Factors in development of shock include loss of blood, disturbed water balance with increased capillary permeability, hypertension due to toxaemia, mechanical trauma of delivery, and the lowering of intra-abdominal pressure with splanchnic vasodilatation which follows delivery. Obstetrical accidents which tend to lead to shock include haemorrhage from placenta praevia, and accidental or postpartum haemorrhage. Rupture of the uterus is probably more common than is recognized clinically. Inversion of the uterus causes rapid shock in most cases, though not in all. Vasomotor collapse may cause death in eclampsia. Some workers believe that emotional factors lead to shock, but this is doubtful.

In the management of these cases the question of concealed bleeding must always be borne in mind. Active treatment consists in allaying pain or apprehension with morphine, retaining body heat, and replacing the volume of circulating blood. Plasma may be used in small units at a distance from a blood bank. Operative procedures should not be begun until measures to overcome shock, including intravenous therapy, have been initiated. The only exception to this rule is in cases where it is necessary to stop active haemorrhage. Transfusion should be started before operation is carried out in cases where haemorrhage is anticipated.

[This article only serves to emphasize the important part played by haemorrhage in maternal mortality and the importance of adequate supplies of blood in all obstetrical work. This includes not only blood banks in maternity units but " flying squad " facilities for domiciliary practice. One point omitted or overlooked by the author is the importance of Rhesus grouping in addition to ABO grouping and cross-matching before transfusion is carried out in parturient women, or indeed in all women who are potential mothers.]

Josephine Barnes

1162. **A New Interpretation of Obstetric Shock.** (Essais sur une nouvelle interprétation du choc obstétrical.)

By F. CISMIGUI. *Gynécologie*, **44**, 247–264, Sept.-Oct., 1947. 37 refs.

ANAESTHESIA.

1163. **Anesthesia in Labor. (Panel Discussion.)**

By J. S. GALANG. *J. Philippine med. Ass.*, **34**, 71–74, Feb. 1948. 3 refs.

1164. **Anesthesia in Obstetrics. (Panel Discussion.)**

By A. BAENS. *J. Philippine med. Ass.*, **34**, 67–70, Feb. 1948.

1165. **Premedication and Anesthesia in Obstetrics: Practical Aspects.**

By B. B. HERSHENSON. *Anesthesiology*, **9**, 73–85, Jan. 1948. 1 fig., 13 refs.

1166. **Dilute Solution, Catheter, Continuous Spinal Analgesia for Labor and Delivery. A Preliminary Report.**

By S. M. SHANE, D. F. KALTREIDER and H. M. COHEN. *Amer. J. Obstet. Gynec.*, **54**, 488–495, Sept. 1947. 3 figs., 4 refs.

The authors claim to have overcome the complications of continuous caudal analgesia and spinal analgesia by injecting into the subarachnoid space through a ureteric catheter an anaesthetic solution (0.05 per cent " pontocaine " (amethocaine) in 10 per cent glucose) so dilute that no somatic sensory loss and little or no motor paralysis was produced, but the pain of uterine contractions was abolished.

" Methedrine ", 0.5 ml., is given and a 16-gauge special directional spinal needle is inserted between the third and fourth lumbar vertebrae into the subarachnoid space, and turned so that its aperture is directed cranially. The catheter is then inserted through the needle until its tip lies about 1 in. (2.5 cm.) beyond the needle point at the lower border of the second lumbar vertebra. It must not be

withdrawn after this, because the sharp edge of the needle might sever it. The needle is gently withdrawn from the body. The catheter is then bent over a roll of gauze and attached with adhesive to the back. The patient is turned on her back with her head raised, and the first injection of 1 ml. of solution (0.5 mg. of pontocaine) is made rapidly so that the solution rises to the region of the eleventh and twelfth thoracic nerves. It does not affect the motor sympathetic nerves to the uterus leaving the fifth and sixth segments, because it is too dilute at this level. This dose may be repeated hourly. It relieves pain due to uterine contractions, but there is still some pain in the back and thighs, due, according to the authors, to progressive cervical dilatation. At full dilatation, in order to relieve this remaining pain, 2 to 3 ml. is injected with the patient half sitting. "Bearing-down" efforts are still possible. Immediately before delivery 4 mg. pontocaine in 2 ml. of 10 per cent glucose is injected during 2 minutes with the patient in the reverse Trendelenburg position, which is maintained for a further minute after the injection. This produces complete relief from pain and relaxation for 1½ to 2 hours. Analgesia is begun in primigravidae at 6 to 7 cm. dilatation and in multigravidae at 3 to 5 cm.; the presenting part must be at least on a level with the ischial spines. The contra-indications given by the authors are contracted pelvis, bleeding, syphilis, tumours of the central nervous system, skin infection at the site of injection, and a floating foetal head.

A table of results in 43 cases is given. There were no maternal or foetal deaths, failures, or complications, apart from headaches not worse than those after spinal analgesia. Labour was not delayed; there was minimal blood loss and babies did not require resuscitation. It is stated that the need for "operative or midforceps interference" was not increased; the table shows that forceps were applied at the outlet in 25 cases, and at the mid-plane in 2 cases, while rotation and forceps delivery was performed in 7 cases; these cases were not, however, associated with prolongation of the second stage.

[The average duration of analgesia in these patients was only 4½ hours, and although the authors' extreme care and attention to detail allowed no complications in this series, the abstracter feels that relief of pain in the last 4½ hours of labour should be possible by less elaborate and potentially dangerous means.]

Aileen Dickins

1167. **Continuous Caudal Analgesia in Obstetrics, Surgery and Therapeutics.**

By R. A. HINGSON. *Curr. Res. Anesth.*, **26**, 177-191, Sept.-Oct., 1947. 14 figs.

This is a very detailed analysis of the results in a series of deliveries conducted under continuous caudal analgesia.

The maternal mortality rate is stated to be lower in the caudal series than in a control series —7.9 per 10,000 deliveries against 19.3 per 10,000. Pain was satisfactorily relieved in 95 per cent of cases. When the labour is expected to be a long one, 0.15 per cent "pontocaine" is used with the ureteric catheter technique; when a short labour is anticipated, 1.5 per cent metycaine is given with a malleable needle. Analgesia is not started until the cervix is 5 cm. dilated in primiparae and 3 cm. in multiparae. Of the control series, 31 per cent were delivered spontaneously, against only 15.5 per cent of the "caudal" series. Maternal morbidity in the "caudal" series was 7.4 per cent, in the controls 10.8 per cent. After caudal analgesia 16.7 per cent required catheterization and of the controls 14.1 per cent.

Respiration of the infant was delayed in 3.6 per cent of the "caudal" series and 9.6 per cent of the controls. The still-birth rate was 9.1 per 1,000 live births against 24.8 per 1,000 in the controls; neonatal mortality was 11.5 per 1,000 live births against 20.8 per 1,000 live births in the controls. With premature infants the neonatal mortality rate was 169 per 1,000 live births as against 294 in the control group.

Other reported uses for caudal block are for Caesarean section, vaginal hysterectomy, herniоplasty, and operations on the perineal region, and for the relief of pain in burns and traumatic injuries of the lower limbs. It has been employed in the diagnosis and treatment of essential hypertension and in the treatment of eclampsia and of uraemic convulsions. Other possible uses are in diabetic gangrene, Buerger's disease, Raynaud's disease, arteriosclerotic gangrene, immersion and trench foot, atrophic ulcerations of the lower limbs, and thrombophlebitis.

[So detailed is this analysis that at times it becomes confusing, and the way in which the author has arrived at some of the figures is occasionally by no means clear. Moreover, some of the conclusions drawn must be regarded as somewhat speculative. Nevertheless caudal block has great possibilities, and it is a pity it has not had a more extensive trial in Britain.] *G. C. Steel*

1168. **Postpartum Headache after Low Spinal Anesthesia in Vaginal Delivery and its Treatment.**

By F. WEINTRAUB, W. ANTINE, and A. J. RAPHAEL. *Amer. J. Obstet. Gynec.*, **54**, 682-686, Oct. 1947. 6 refs.

Low spinal analgesia in obstetrics gave rise to a 15 per cent incidence of postpartum headaches in a series investigated by the authors during and after delivery. They conclude that two factors are particularly responsible for these headaches—the sudden release of intra-abdominal pressure superimposed on the action of the anaesthetic, and the spinal fluid leakage. The former results in a pooling of blood in the splanchnic vessels augmented by vasomotor paralysis due to the action of the spinal analgesic on the sympathetic nerves.

To compensate this, abdominal compression by means of an abdominal binder proved efficacious in the majority of cases, and the authors make use of the old remedy of applying a sandbag to the abdomen immediately after delivery as a prophylactic measure. To avoid spinal fluid leakage fine-gauge needles must be used. The inadequacy of the various drugs advocated is stressed. *E. D. Grasby*

1169. **New Horizons in Therapeutic Nerve Block in the Treatment of Vascular and Renal Emergencies with Continuous Caudal and Continuous Spinal Analgesia and Anesthesia.**

By R. Hingson, F. E. Whitacre, J. G. Hughes, H. B. Turner, and J. M. Barnett. *Sth. Surg.*, **13**, 580–609, Aug. 1947. 22 figs., 15 refs.

Conduction anaesthesia was first practised 50 years after the discovery of inhalation anaesthesia. It is segmental and eliminates pain at its source instead of blunting its central interpretation. When pain is obliterated by anaesthesia the functions of many tissues are altered; a study of these alterations may be of use in treatment. Therapeutic nerve block depends on the fact that the pain and vasomotor fibres are blocked earlier, more fully, and longer than the motor fibres.

"Experience with 15,000 patients under spinal, caudal, paravertebral, presacral, peridural, and sympathetic ganglion anaesthesia, clearly convinces one of the cardinal role that is played by the peripheral vascular bed when it is subject to temporary conduction denervation. No one can watch a hypertensive, eclamptic, comatose, convulsant patient, in acute heart failure and pulmonary oedema, rescued within 30 minutes by a therapeutic continuous caudal or continuous spinal anaesthesia—which frequently lowers the blood pressure 100 mm. of mercury, and simultaneously relieves headache and blurred vision, raises the skin temperature of the feet 30° F., diminishes near-fatal pulmonary oedema, slows and steadies the failing heart, increases renal output and coincidentally abolishes pain—without appreciating that in this mechanism lies one of the most potent weapons the physician possesses to wage against disease and death."

Spinal and continuous caudal analgesia are strongly recommended for the obstetric patient, handicapped by disease. Since 1943, the authors have used these methods in 85 labours in women with cardiac disease; there have been no maternal deaths. Spinal analgesia, by pooling blood at the periphery, dilating veins, and decreasing venous pressure, can be regarded as a bloodless phlebotomy, useful in heart failure and pulmonary oedema. By this method the venous pressure can be lowered without any loss of haemoglobin. When the effects of a single dose of a spinal analgesic have worn off, the symptoms—high blood pressure, paralytic ileus—may return. This indicates the need for a continuous, controlled application of the block for as long a time as may be necessary.

A case of eclampsia with severe heart failure and pulmonary oedema is described. The patient was moribund; oxygen failed to relieve the cyanosis and digitalis intravenously did not relieve the heart failure. There was improvement immediately after the administration of continuous caudal analgesia with "metycaine". When this was discontinued after 5 hours the symptoms recurred until the block was resumed. The patient then had a copious haemorrhage from a placenta praevia. A Caesarean section was performed and caudal analgesia continued for the next 20 hours The level of analgesia then fell and could not be maintained. Again the symptoms came back, so continuous spinal "pontocaine" (amethocaine) was given for 48 hours, after which it was discontinued, all symptoms having subsided. Four very severe cases of acute nephritis in children were treated in this way; 2 patients recovered. The authors also describe a case of acute nephritis, which probably provides a record for duration of spinal analgesia; the latter was maintained continuously for 10 days and 6 hours, during which time a critical hypertension was reduced 114 times. The acute nephritis with anuria followed cavernous sinus thrombosis. Seventeen cases of vascular and renal emergencies are tabulated; 9 of the patients recovered. The treatment was also given in 18 cases of eclampsia; there were 2 deaths in this group. *W. Stanley Sykes*

1170. **Amidone (Miadone) as an Obstetric Analgesic. Trial in 62 Cases.**

By F. Prescott and S. G. Ransom. *Lancet*, **2**, 501–503, Oct. 4, 1947. 6 refs.

A clinical trial of "physeptone" ("amidone" or "miadone") as an obstetric analgesic in 62 cases is described. The drug was prepared synthetically in Germany during the war, and, although unrelated to morphine, it has many of the pharmacological properties of the latter. As an analgesic it is as potent as morphine and ten times as potent as pethidine. It is less toxic than pethidine and equally effective as a spasmolytic. As a respiratory depressant physeptone was initially less powerful than pethidine; but the effect lasted much longer, with the result that over a period of 3 hours it produced a greater depression of respiration than pethidine.

In the clinical trial conducted by the authors physeptone was given to 62 primigravidae in labour; to a control series of 85 pethidine was administered. The investigation was discontinued because although the drug was as effective as pethidine in relieving the pain of labour, it was much more depressant to the foetus. This was particularly noted when it had been administered over 4 hours before delivery. *J. Stallworthy*

1171. **Intravenous Drip Infusion of Procaine in Labour.** (L'analgesia endovena a goccia con Recorcaina in travaglio di parto.)

By A. Rizzuti and F. Olivelli. *Ginecologia, Torino*, **14**, 32–42, Jan. 1948. 1 ref.

1172. **Demerol and Scopolamine in Obstetrics.**

By G. Rustia and L. Almeda. *J. Philippine med. Ass.*, **34**, 61-65, Feb. 1948. 6 refs.

1173. **Trilene as an Analgesic in Labour.** (Použití trilenu k tišení porodních bolestí.)

By M. Steiner. *Ceskoslov. Gynaek.*, **13**, 151–157, 1948.

1174. **Epidural Analgesia in Obstetrics.** (Nuestra experiencia sobre la anestesia peridural en ginecologia.)

By P. Capell Martinez. *Med. esp.*, **19**, 26–35, Jan. 1948. Bibliography.

1175. **Nitrous Oxide Analgesia in Labour.** (Použití kysličníku dusného k tišeni bolestí pri porodu.)

By J. Jerie and A. Pechar. *Ceskoslov. Gynaek.*, **13**, 142–150, 1948. 2 figs.

PUERPERIUM.

1176. **Early Ambulation after Labour or Abortion.** (Théorie et pratique du lever précoce après l'accouchement ou l'avortement par voie vaginale.)

By J. Kreis. *Rev. franç. Gynéc.*, **43**, 45–56, Feb. 1948.

1177. **Late Haemorrhage in the Puerperium (Without Retention).** (Sobre hemorrhagias tardias del puerperio (sin retención).)

By J. F. Popelaire. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 170–185, Aug. 1947. 2 figs., 5 refs.

1178. **Necrosis of a Fibroid During Puerperium.** (Martwica miesniaka w przebiegu pologu.)

By J. Sieroszewski. *Polsk. Tyg. lek.*, **2**, 1093–1094, Sept. 1947. 13 refs.

1179. **Essential Thrombocytopenic Purpura and the Puerperium.** (Sobre enfermedad de Werlhof y estado puerperal.)

By H. Del Valle and O. Trivelli. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 253–262, Oct. 1947.

1180. **Magnesium Sulphate in the Treatment of Puerperal Infections.** [In Russian.]

By L. I. Bublichenko. *Akush. Ginec.*, No. 2, 11–13, 1947.

The effect of intramuscular injection of magnesium sulphate on pelvic sepsis has been studied in 100 cases of puerperal infection. The dose administered was 10 ml. of a 25 per cent solution, 38 patients receiving only one injection, 29 two injections, 16 patients three injections, 12 patients four injections, and 5 five injections. When the treatment began 4 patients had a temperature below 38° C.; 36 patients had a temperature of 38° to 39° C.; 39 patients had a temperature of 39° to 40° C.; and 21 a temperature of over 40° C. In all cases pain rapidly disappeared as a result of the injection. The temperature subsided in 72 cases. The swelling diminished, and later disappeared completely. The author concludes that this is a valuable drug in pelvic inflammatory conditions. *Nicolas Tereshchenko*

1181. **Recognition and Treatment of Puerperal Pyrexia.** (Erkennung und Behandlung des Puerperalfiebers.)

By W. Schultz. *Z. Geburtsh. Gynäk.*, **129**, 22–45, 1948. 6 figs., Bibliography.

1182. **The History of Semmelweis's Teaching.** (Zur Geschichte der Semmelweisschen Lehre.)

By E. F. Podach. *Z. Geburtsh. Gynäk.*, **129**, 59–69, 1948. 12 refs.

1183. **Influence of Recent Coitus on the Vaginal Flora and on Puerperal Infection.** [In Russian.]

By P. Kostic. *Srpski Arkhiv*, **46**, 30–40, Jan. 1948. 14 refs.

1184. **Penicillin in Infections Associated with Labour, the Puerperium, and Abortion.** (La penicilina en los procesos sépticos del parto, del puerperio y del aborto.)

By V. Beato and C. Padilla. *Toko-ginec. prat.*, **7**, 94–112, Mar. 1948. 31 refs.

1185. **Penicillin and Sulphonamide Therapy of Puerperal Infections.** (Penicilinoterapia y sulfamidoterapia en infecciones puerperales.)

By H. Mujica Lorca and O. Trivelli Rocchi. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 189–212, Sept. 1947. 3 figs.

1186. ***B. Coli* Meningitis in the Puerperal State. Report of Two Cases.**

By K. J. McMorrow and F. H. Top. *J. Michigan med. Soc.*, **47**, 62–63, Jan. 1948. 6 refs.

LACTATION.

1187. **Hormones and Lactation. Dried Thyroid Gland.**

By M. Robinson. *Lancet*, **2**, 385–387, Sept. 13, 1947. 5 refs.

An investigation was made of the relation between thyroid administration and lactation, 500 untreated lactating mothers being used as controls and observed for the first 6 months. A flow of 10 oz. (284 ml.) milk by the fifth day or 16 oz. (452 ml.) by the tenth day of the puerperium was usually a sign of an established lactation, and mothers whose lactation failed before the sixth month usually had not come up to this standard. In 332 cases of failure to establish lactation a detailed study was carried out of dried thyroid, crude anterior pituitary, thy-

roxine, iodine, and injections of physiological saline. Treatment lasted only from the seventh until the twelfth day of the puerperium, further treatment being found to give no better results. Up to gr. 12 (0.78 g.) of thyroid daily was administered, in order to break down resistance with no apparent harmful results. The results with the pituitary preparation were no better than the results in those patients receiving injections of saline or no treatment at all; thyroid alone gave as good results as did a combination of thyroid and anterior pituitary. With thyroxine there was an increase in milk yield similar to that obtained with the larger doses of thyroid extract, but the size of the dose did not affect the results. With large doses of thyroid (gr. 9 to 12 (0.6 to 0.8 g.)), the milk yield was increased by more than 100 per cent.

In all patients receiving iodine there was an increase in breast milk. *Beryl Twyman*

1188. **The Biological Activators of Lactation.** (Gli attivatori biologici della secrezione lattea.)

By I. MASTRONARDI. *Ginecologia, Torino*, **14**, 43-47, Jan. 1948. 7 refs.

1189. **Failure of Lactogenic Hormone to Maintain Pregnancy Involution of the Thymus.**

By C. GRÉGOIRE. *J. Endrocrinol*, **5**, 115-120, July 1947. 6 figs., 3 refs.

An attempt was made to determine whether lactogenic hormone is responsible for the maintenance of pregnancy involution of the thymus during normal suckling. Primiparous female albino rats 6 to 7 months old were spayed immediately after removal of their litters at birth. Twenty received daily subcutaneous injections for 10 days of 0.3 ml. pituitary lactogenic hormone (10 Riddle units per mg.) dissolved in sodium hydroxide solution to a strength of 20 mg. per ml. and adjusted to pH 10.0; 17 control rats were similarly injected with the solvent. The rats were killed on the eleventh day. Organ weights were calculated as grammes per kilo body weight.

There was no histological difference in the thymus glands of the two groups or in the weight. The difference in weight of the adrenals and of the thyroid glands was not significant ($P=0.2$). Histologically, the thyroid glands of both groups were inactive, but the epithelial height in the follicles of the injected group was significantly lower than in the controls (12.3 ± 0.21 mm., and 13.6 ± 0.3 mm.). The differences in weight of spleen (injected 2.64 ± 0.12; control 2.33 ± 0.1) and of lymph nodes of the subscapulary and axillary groups (injected 0.757 ± 0.039; control 0.535 ± 0.021) and of the inguinal group (injected 0.365 ± 0.024; control 0.299 ± 0.015) were significant. [No value for P is given.] There was no difference in the weight of the lymph nodes of the iliac group (injected 0.159; control 0.168). The mammary glands of the injected rats showed less involution than those of the controls, although considerable variation occurred in different parts of the same gland as well as in different glands of the same animal. The milk ducts of the injected rats were distended with secretion.

No relation between retarded mammary involution and weight of thymus gland could be shown, but there was a possible relation between retarded mammary involution and hypertrophy of the lymph nodes and thyroid epithelial height. The author concludes that the maintenance of pregnancy involution of the thymus glands during normal suckling is not due to the action of lactogenic hormone. He suggests that hypertrophy of the superficial lymph nodes is a reaction to increased activity of the mammary glands, and thyroid inactivity is a result of a change in thyrotrophic hormone secretion following milk retention.

S. A. Simpson

1190. **Metabolism of Women During the Reproductive Cycle. XIV. The Utilization of Pantothenic Acid During Lactation.**

By M. N. CORYELL, M. E. HARRIS, S. MILLER, H. H. WILLIAMS, and I. G. MACY. *J. Lab. clin. Med.*, **32**, 1454-1461, Dec. 1947. 28 refs.

The patients in these studies were multiparous women, selected during the first 3 months of pregnancy, who had successfully nursed other children. Seven of them were studied during the first 10 days after delivery, and 5 of these, with 4 others, were studied during seventeen 5-day periods while they were producing mature milk. Mixed samples of the food and the total daily output of milk and urine were analyzed for pantothenic acid by a microbiological method. The average daily intake of pantothenic acid was between 6 and 9.5 mg. The output in the milk gradually increased during the 10 days after delivery in proportion to the increase in volume. The total output in milk and urine was on the average rather less than the intake during the first 5 days and rather more during the next 5 days. During the periods of mature milk production there was no relation between the intake, the secretion in the milk, and the excretion in the urine. The excretion in the urine was 32 to 89 per cent of the intake, and the total content in urine and milk was 63 to 103 per cent of the intake. *J. Yudkin*

1191. **Metabolism of Women During the Reproductive Cycle. XV. The Utilization of Biotin During Lactation.**

By M. N. CORYELL, M. E. HARRIS, S. MILLER, M. M. RUTLEDGE, H. H. WILLIAMS and I. G. MACY. *J. Lab. clin. Med.*, **32**, 1462-1469, Dec. 1947. 22 refs.

Biotin was estimated in the same specimens of food, milk and urine as those examined in the previous study (Abstract 1190). The daily intake was 42 to 70 μg. free biotin (average 56 μg.) and 52 to 117 μg. total biotin (average 81 μg.). The

output in the milk was too low to be measured during the first few days after delivery; from the fifth to the tenth days it increased rapidly but varied greatly in the different subjects (0.24 μg. to 25.17 μg. daily). In the mature milk the daily output was 0.9 to 10.8 μg. The urine contained 8 to 54 μg. daily. *J. Yudkin*

1192. **Metabolism of Women During the Reproductive Cycle. XVI. The Effect of Multivitamin Supplements on the Secretion of Vitamin A in Human Milk.**

By M. Lesher, A. Robinson, J. K. Brody, H. H. Williams, and I. G. Macy. *J. Amer. dietet. Ass.* **24**, 12–16, Jan. 1948. 34 refs.

1193. **Acute Puerperal Mastitis—A Review.**

By W. G. Leary. *California Med.*, **68**, 147–151, Mar. 1948. 13 refs.

THE INFANT.

1194. **The Titratable Acidity, pH, Ammonia and Phosphates in the Urines of Very Young Infants.**

By R. A. McCance and M. A. von Finck. *Arch. Dis. Childh.*, **22**, 200–209, Dec. 1947. 5 figs., 45 refs.

For some time after birth the kidney function is still immature, and it has been shown that the glomerular filtration rate, and the urea, sodium, and chloride clearances are low in newborn babies. This paper extends these observations by furnishing data on the pH, the titratable acidity, the ammonia coefficients, and the phosphate in the urine of newborn babies born in occupied Germany. Comparisons are made with specimens obtained from healthy British in Germany.

The data are based on the examination of urine from 72 infants, 36 adults, and 10 diabetics. All the babies were breast-fed and no additional water was given. The following results were obtained: (1) The average pH tended to fall slightly after birth with an increase as milk flow was established. The pH did not differ from the average in urine from healthy adults. (2) The titratable acidity varied with the concentration of the urine and fell as the pH rose. (3) Ammonia coefficients were unaffected by the age of the baby, but on the average were higher than in normal adults. (4) The ratio of the ammonia to the acidity was higher in infants than in adults. (5) Urine of newborn infants contained very little phosphate. This might lead to an incapacity to deal with an acidosis, should one occur. (6) Urine passed *in utero* was very dilute but differed in no other way from that passed in the first few days of life. *A. G. Watkins*

1195. **Asphyxia of the Newborn.** (Asfixia del recién nacido.)

By R. Gantes. *Rev. chil. Pediat.*, **18**, 715–732, Oct., 1947. 7 refs.

1196. **Chronic Encephalopathy and Obstetric Trauma.** (Encéphalopathies chroniques et traumatismes obstétricaux.)

By —. Roudinesco, M. R. Klein and M. Nicolle. *Sem. Hôp., Paris*, **23**, 2290–2296, Oct. 14, 1947. 6 figs., 1 ref.

A series of 524 cases of chronic encephalopathy in children is reviewed in order to determine the incidence of obstetric trauma. Their classification and relative frequency are given as follows: intellectual retardation, 68.51 per cent; psychomotor retardation, 6.87 per cent; epilepsy, 13.5 per cent; various motor disorders, 7.25 per cent; microcephaly, 3.28 per cent; hydrocephalus, 0.76 per cent. The series contains very few cases of Little's disease, which is diagnosed only in children showing spasticity and a typical position of the limbs on being held up and is not taken to include paralysis, pyramidal-type contractures and reflex changes, convulsions, or mental deficiency.

No traumatic cause was found responsible in the cases of pure intellectual retardation. With associated motor disturbances, however, 4 of the 36 cases in the series could be regarded as the result of obstetric trauma. Eight out of the 70 cases of epilepsy were attributed to birth injury as their symptoms began within 18 months of a difficult birth. Of the various motor disturbances 21 (55.26 per cent) were considered to be due to obstetric trauma, 13 of these being hemiplegias (70 per cent of those reviewed). Six cases of hemiplegia are described in detail, and it is demonstrated from the histories, symptoms, and results of encephalography, ventriculography, or surgical exploration that three types can be differentiated. Type 1 hemiplegia is associated with generalized encephalography; the cortex is atrophied with compensatory ventricular dilatation, mainly on the side corresponding to the hemiplegia. Type 2 hemiplegia is characterized by adhesions between cortex and meninges with or without arachnoid cyst formation; surgical treatment is often successful. Type 3 shows progressive hemiplegia, often with convulsions, and here formation of adhesions or cysts is complicated by a spreading meningeal reaction; surgical intervention should not be delayed. Amongst the other types of motor disturbance the connection with birth injury was less clear. Criteria for attributing microcephaly to obstetric trauma were a history of difficult birth, convulsions, and early fusion of skull bones (secondary to diffuse cerebral sclerosis). Few cases of hydrocephalus were attributed to birth injury, since the condition started in the third or fourth month of life and was preceded by convulsions.

The authors regret that they have been unable to review a series of infants subjected to obstetric trauma and to follow them up to establish the incidence of motor and intellectual consequence.

H. Herlinger

1197. **A Case of Dicephalic Monstrosity Delivered Without Medical Aid.**

By L. W. ALDERMAN. *Med. J. Aust.*, **1**, 531–532, Apr. 24, 1948. 1 fig., 2 refs.

1198. **Recurrent Chronic Subdural Hematoma in an Infant. Case Report.**

By A. KAPLAN. *J. Mt Sinai Hosp.*, **14**, 418–423, Sept.-Oct. 1947. 3 figs., 7 refs.

The author reports an unusual case of chronic subdural haematoma, originally bilateral, which recurred on one side after operation, with formation of a large cyst between the scalp and the bone flap, which had been raised at the previous exploration. The membrane forming this cyst was continuous through a defect in the dura with that of the underlying chronic subdural haematoma. Complete removal of this membrane resulted in cure, and the importance of this feature is stressed.

A brief review of the literature on chronic subdural haematoma is included, and points in the diagnosis are discussed. The importance of making the diagnosis early is obvious, since operative treatment can prevent permanent cerebral damage. "Any infant who has been progressing normally up to the age of 4 or 5 months and then begins to have periods of lethargy, convulsions, vomiting, restlessness, and disproportionate enlargement of the head should be suspected of a chronic subdural haematoma." The diagnosis can be established by the simple procedure of tapping the subdural spaces through the lateral angles of the anterior fontanelle.

M. Baber

1199. **Response of New-born Children to Hypertonic Solutions of Sodium Chloride and of Urea.**

By R. F. A. DEAN and R. A. MCCANCE. *Nature, Lond.*, **160**, 904, Dec. 27, 1947. 1 fig., 3 refs.

The authors examined the diuresis following injection of hypertonic saline and urea in infants suffering from meningomyelocele, and compared the findings with those in normal adults. While a diuresis occurred in both infants and adults, this was much less marked on a basis of surface area in infants, while after saline the osmotic pressure of the urine behaved differently in the two groups, falling in adults and rising in infants. Excretion of administered salt was strikingly slower in infants. Somewhat similar results were obtained with urea, though the discrepancies between age groups were less marked and the diuresis less.

Alex. Comfort

1200. **The Problem of Prematurity.**

By G. B. WISWELL. *Nova Scotia med. Bull.*, **27**, 33–43, Feb. 1948.

1201. **The Prognosis of Prematurity in a Children's Hospital Compared with that in 4 Non-pediatric Hospitals.** (Praematurers prognose paa en børneafdeling og paa 4 ikke-børneafdelinger.)

By I. BOESEN. *Nord. Med.*, **37**, 418–421, Feb. 27, 1948. 3 refs.

1202. **Experimental Use of Testosterone Compounds in Premature Infants.**

By E. K. SHELTON, A. E. VARDEN, and J. S. MARK. *J. clin. Endocrinol.*, **7**, 708–713, Oct. 1947. 12 refs.

The authors describe the results of treatment of 74 premature infants, weighing under 2 kg. at birth, with testosterone compounds. The infants were divided into three groups: a control group of 20; a group of 30 infants who received methyl testosterone; and a group of 24 who received testosterone propionate. They were further divided in two groups according to birth weight, the first group weighing 1 to 1.5 kg. at birth and the second 1.5 to 2 kg. Progress was assessed by the time taken to regain birth weight and to reach 2.5 kg.

Methyl testosterone was given in doses of 5 mg. daily in propylene glycol, and was placed direct on the tongue immediately before oral feeding or gavage. Testosterone propionate was given intramuscularly into the gluteal region in a dose of 4 mg. daily. No toxic effects were noted. There was no abnormal hair growth or enlargement of the genitalia in either sex. In all groups the babies treated with testosterone showed a significant shortening of the time required to regain birth weight and to reach 2.5 kg. Particularly significant are the observations on four sets of twins, where one sibling was used as a control in each case. Some of the initial gain may be due to water and salt retention, but no sharp loss of weight occurred when testosterone was withdrawn. The effect of testosterone is to cause retention of nitrogen, resulting in building of tissues, growth, and muscle hypertrophy. There is also water, sodium, potassium, and chloride retention. It has been suggested that premature closing of the epiphyses may occur, with resultant stunting of growth. The infants in the present series were examined by serial radiographs of the wrists and ankles for the first year of life. No difference was found between the treated series and the controls.

The authors do not advocate the routine use of testosterone for all premature infants, but suggest that it may be useful in selected cases needing metabolic stimulation.

Josephine Barnes

1203. **The Treatment of Certain Serious Infections in the Newly-born Infant.**

By P. J. WHITE. *Nebraska St. med. J.*, **33**, 13–17, Jan. 1948. 16 refs.

1204. **Oral Penicillin in Infants.**

By G. S. HUSSON. *J. Pediat.*, **31**, 651–657, Dec. 1947. 1 fig., 23 refs.

This investigation was undertaken to discover the degree of alimentary absorption and the concentrations in the blood of penicillin administered orally. A daily dose of 20,000 units of penicillin dissolved in 5 to 10 ml. water was given to healthy babies 1 week to 5 months old immediately before their milk feed. Serum levels of penicillin were

estimated at varying intervals after the feed, but especially at the end of the first and third hours. In all, 22 estimations were made. An adequate therapeutic level of penicillin was considered to be 0.06 unit or over per ml. This serum level was obtained in all cases up to 3 hours after injection. Gastric acidity is less of an obstacle to absorption of oral penicillin in an infant than in an older child or an adult. After a high gastric acidity in the first 24 hours of life there is a decline until the tenth day, which is followed by a gradual increase to adult level at the age of 3 years. Not only is there a low gastric acidity but also the relative inefficiency of the infant's kidney tends to delay penicillin excretion. A third factor favourable to penicillin retention in infants is that there are fewer penicillinase-producing organisms in the intestinal tract. The author concludes that oral penicillin is a safe and practical way of treating infection in infants due to ordinary penicillin-sensitive organisms. *A. G. Watkins*

1205. **Febrile Convulsions: A Clinical Study with Special Reference to Heredity and Prognosis.**

By S. Livingston, E. M. Bridge, and L. Kajdi. *J. Pediat.*, **31**, 509–512, Nov. 1947. 11 refs.

The literature of convulsions in infancy is reviewed. Because the type most generally seen in infants is the febrile convulsion, children whose first convulsion had been associated with acute febrile illness were studied. The 94 children in this series had had such frequent convulsions that they were considered to be epileptic.

They were divided into two groups: (1) those in whom the initial and subsequent convulsions were accompanied by fever; (2) those in whom the inital and some of the ensuing convulsions were febrile. All the children in the first group and 37 per cent in the second group recovered, in the sense that 2 years elapsed without a convulsion. By a different grouping of the patients the prognosis in different types of convulsion was estimated. Of those who had generalized convulsions only, 36 (64 per cent) recovered, but those with occasional evidence of a focal lesion, 10 (26 per cent) recovered. The recovery rate was higher in those who had fewer recurrences of the convulsions. The prognosis was less favourable if close relatives had suffered from chronic epilepsy, and also if the history showed no incidence of convulsive disorders. There would seem to be, therefore, a significant difference in the hereditary factors which predispose to epilepsy and those predisposing to childhood convulsions. This suggests that, in the absence of a hereditary predisposition, the convulsion is more likely to be due to organic brain damage. Race, sex, age at onset, and treatment did not influence the prognosis. *B. S. P. Gurney*

1206. **Contagious Eruptive Fever with Unusual Symptoms in Infancy. Report of 12 Cases.** [In English.]

By S. Zimanyi. *Paediat. danub.*, **2**, 208–215, Oct. 1947. 9 refs.

In February and March 1947, 12 infants aged from 7 to 24 months developed an acute febrile illness with unusual features. Ten cases occurred in out-patients, from widely distributed homes, of a maternity and child welfare clinic in Budapest, and 2 were seen in private practice. There was no contact outside the waiting-rooms, and it seems that the first infant observed (aged 7 months) infected 4 others [in the waiting-room?], and these in turn conveyed the disease to 4 more, the latent intervals being in both instances 5 days, presumably the incubation period of the disease. In all, the attack began suddenly without prodromata, and physical signs were limited to pyrexia (104°F.; 40°C.) and the simultaneous appearance of a rash of scarlatiniform type which was most profuse upon the extensor surfaces of the limbs but also invaded the palms, soles, and face. The chest and abdomen were not involved. The erythema, which was not punctate, was slightly raised and "appeared to have a special predilection for the follicles". The colour of the rash was "less reddish" than that of scarlet fever. On the second and third day of the erythema, petechiae were noted at the sites already invaded. High pyrexia was maintained until the fourth or fifth day and then began to subside, the temperature reaching normal by the sixth or seventh day. Concurrently, the rash faded, and by the seventh to tenth day was hardly perceptible. "Branny" desquamation of the areas of skin invaded followed.

During the first few hours of the illness the general condition of the patients seemed unaffected, but with the appearance of petechiae they became "very ill" [the text suggests toxaemia]. In all cases the tongue was clean; there was no diarrhoea; the buccal and pharyngeal mucous membranes were normal; and there was no enlargement of the lymph nodes. Blood counts in 5 cases were similar; erythrocytes normal; white cells 9,600 to 11,000 per c.mm.; neutrophils 35 to 40 per cent, lymphocytes 48 to 52 per cent, mononuclears 2 to 3 per cent, and immature cells 5 to 8 per cent. The platelet count was reduced (70,000 to 10,000) and bleeding time prolonged (3 to 4 minutes). Erythrocyte sedimentation rate was 60 to 70 mm. [presumably Westergren's method was used]. Repetition of the red and white cell counts a few days later revealed no change, but the platelet counts were then normal and the bleeding time had decreased by half. The author was able to exclude scarlet fever, measles, rubella, exanthema subitum [roseola infantum of Zahorsky], erythema infectiosum, erythema multiforme, influenza, and drug rashes; he believes that his cases differed essentially from the febrile exanthemata hitherto recorded.

[The blood picture is not inconsistent with a virus infection. Purpura haemorrhagica, it is

interesting to note, has been recorded in association with thrombocytopenia and prolonged bleeding time by Piten and by Gunn in 2 cases of rubella. In both, purpura appeared after the rash had faded.] *E. H. R. Harries*

1207. **A New Treatment for Diaper Rash. Preliminary Report.**

By R. A. Benson, L. B. Slobody, L. Lillick, A. Maffia, and N. Sullivan. *J. Pediat.*, **31**, 369–374, Oct. 1947. 1 fig., 4 refs.

Mercury perchloride, 1 in 4,000, has long been used as a rinse for infants' napkins when it is desired to eliminate the urea-splitting organisms which are the cause of ammonia dermatitis. A new organic chemical " diapene " (a quarternary ammonium compound *p*-di*iso*butylcresoxyethoxyethyldimethylbenzyl ammonium chloride monohydrate) has been introduced, and this study shows that it is as effective a germicide as mercury perchloride for this purpose, and has the advantage of being less poisonous. The ammonia dermatitis in 49 out of 50 infants was cleared within 1 week when the napkins were rinsed in 1 in 25,000 diapene. *D. Gairdner*

1208. **Staphylococcal Pneumonia in Childhood. Pathological Considerations.**

By K. J. Guthrie and G. L. Montgomery. *Lancet*, **2**, 752–755, Nov. 22, 1947. 30 refs.

This paper is concerned with 55 cases of staphylococcal pneumonia coming to necropsy at the Royal Hospital for Sick Children, Glasgow, in the decade 1936–45, and a further 16 occurring during an outbreak of staphylococcal infection at a maternity nursery. Two-thirds of the first group of patients were under 6 months of age. The lungs of those who died in the early stages showed macroscopically a red haemorrhagic pneumonia, diffuse and localized. In the later stages there was a diffuse, greyish change, with local suppurative softening and sometimes frank abscess formation. Suppurative bronchitis or bronchiolitis was often present and empyema occurred in a little under 50 per cent; pyopneumothorax was seen once only. [This complication is said to be not uncommon in staphylococcal pneumonia in infants.] Microscopically, in the early stages foci in which the alveoli were stuffed with red cells were surrounded by zones containing oedema fluid. In the later stages small abscesses were separated by oedematous or haemorrhagic lung tissue. From the lungs pure cultures of deeply pigmented, non-haemolytic staphylococci were obtained, which, in the cases in which they were tested, were coagulase-positive and penicillin-sensitive. The disease was often rapidly fatal, sometimes within 48 hours of onset. Severe dyspnoea was often the first symptom; less frequently the disease began with cough, vomiting, or rigour. In small children sputum is not usually obtainable and throat swabs and lung punctures were found to be unreliable. [Presumably it is for this reason that no mortality rates are given.] With this difficulty in bacteriological diagnosis the authors recommend immediate administration of penicillin in all cases of severe pneumonia in children. They find that staphylococcal pneumonia has become commoner in recent years as shown both by necropsy studies and by the increased proportion of staphylococcal empyema.

In the maternity nursery the disease mainly affected premature infants, and the outbreak coincided with an epidemic of " clinical influenza " among the mothers and nurses. The staphylococcal carrier rate among the staff was not unduly high, and staphylococci were not isolated from the infants' feeds. Most of the infants, however, were nasal carriers of staphylococci, and the pneumonia was therefore thought to have been endogenous, possibly with a virus infection as a predisposing factor. Clinically the onset was characterized by sudden collapse, leading to dehydration and cyanosis within 48 hours and without localizing symptoms. Bacteriologically *Staphylococcus aureus* was isolated before or after death from 27 out of 31 throat swabs, 40 out of 54 cultures from lung punctures, and about half of 50 combined lung and spleen cultures. Apart from the absence of empyema and less obvious macroscopic bronchitis, the morbid anatomy showed no significant difference from that of the first group. *John Crofton*

1209. **Peritonitis Associated with Neonatal Diarrhea.**

By J. P. Doenges. *J. Pediat.*, **31**, 669–678, Dec. 1947. 2 figs., 21 refs.

Three cases of neonatal diarrhoea were complicated by non-specific ulceration of the small bowel with multiple perforations and peritonitis. One of the cases also showed similar lesions in the ascending colon and purulent erosions in an inflamed appendix. Clinically the patients had the typical projectile, greenish-white, foul watery stools of neonatal diarrhoea and showed dehydration and acidosis. A rising temperature not responding to sulphadiazine and marked abdominal distension were the symptoms indicating the complication. In the terminal stages there was extreme distension, leading to respiratory embarrassment, regurgitations and increasing acidosis. Abdominal rigidity was not seen and the character of the stools was not altered.

The pathological reports described the presence in the peritoneal cavity of yellowish fluid and of haemorrhagic and purulent areas on the serosa of many loops. In two of the cases collections of pus were found in the ileo-colic region. Peyer's patches and mesenteric lymph nodes were enlarged. The perforations were from 1 to 8 mm. in diameter and surrounded by induration. Microscopically they showed hyperaemia, polymorphonuclear infiltration, and central necrosis. The more extensive loss of mucosa than of underlying layers indicates the presence of the causal agent in the lumen of the bowel. There was no response to treatment in any

of the cases. Surgical intervention would have been futile in view of the multiplicity of lesions.

The author reviews briefly the aetiology of neonatal diarrhoea and of ulceration and peritonitis in the newborn. *H. Herlinger*

1210. **The Question of Sulphadiazine Treatment of Infantile Dyspepsias.** (Zur Frage der Sulfapyrimidinbehandlung der Säuglingsdyspepsien.)

By R. Klose. *Arch. Kinderheilk.*, **133**, 175–180, 1947. 5 refs.

The action of sulphadiazine in the treatment of gastro-intestinal disorders in infancy was investigated. A series of 423 cases, all acute, was observed, every other child receiving sulphadiazine by mouth in doses of 0.15 g. per kilo. body weight for about 6 days. This was in addition to the routine dietetic treatment. The drug did not appear to have any effect, either on the number or the duration of the loose stools, on the mortality, or on the length of stay in hospital.

[This result is rather surprising, since all forms of gastro-intestinal disorder—dietetic, infective, or due to parenteral infection—were treated in the series.] *J. G. Jamieson*

1211. **Dry Gangrene of the Newborn.** (Les gangrènes sèches du nouveau-né.)

By L. Cleisz and J. Bret. *Gynéc. et Obstét.*, **47**, 204–211, 1948. 12 figs., 7 refs.

1212. **Changes in the Bone Marrow in Megaloblastic Anemias of Infancy Before and After Folic Acid Therapy.**

By W. W. Zuelzer, A. Newhall, and L. Hutaff. *J. Lab. clin. Med.*, **32**, 1217–1230, Oct. 1947. 12 figs., 7 refs.

The bone marrow from 15 patients with megaloblastic anaemia of infancy was studied over a period of 21 months at the Children's Hospital, Michigan. In 6 patients erythropoiesis was of the megaloblastic type with a high proportion of basophilic cells. Seven of the patients showed classical megaloblasts in the bone marrow but these did not constitute the majority of the immature red cells. The bone marrow of the remaining 2 patients was of a normoblastic type.

The sequence of changes seen in the bone marrow after treatment with folic acid was as follows: The megaloblasts lost their characteristic structure, and in 12 to 24 hours the erythroblasts assumed an appearance intermediate between that of megaloblasts and normoblasts. Two days after the treatment started the transformation was complete and the bone marrow was essentially of a normoblastic pattern. The authors state that their findings indicate that only the late eosinophilic megaloblasts escape the effect of folic acid and are not transformed into normoblasts. This they consider to be due to the fact that the cells are past the stage where multiplication can occur. They claim that their observations on the evolution and regression of the megaloblastic pattern do not support either the view that megaloblasts are normal constituents of the marrow or the conception that these cells are genetically different from normal erythroblasts and are immutably fixed in their characteristics by the nature of their ancestry. *R. Winston Evans*

1213. **Four Cases of Erythroblastosis Foetalis.** (Nota clínica y anatomopatológica sobre cuatro casos de eritroblastosis fetalis.)

By E. Martinez Carmona and R. Roca de Vinals. *Med. esp.*, **19**, 103–109, Jan. 1948. 8 figs. Bibliography.

1214. **The Rh Factor in Obstetrics. Report of 572 Cases of Infants of Rh Negative Mothers, 232 of whom Received Transfusions of Mother's Blood.**

By H. W. Mayes. *Surg. Gynec. Obstet.*, **85**, 432–446, Oct. 1947. 6 figs., 7 refs.

The contention of this paper is that cord transfusion of maternal blood should be performed prophylactically in infants of Rh-negative mothers. With maternal blood, in marked contrast to donor's blood, no reactions occur and the blood picture improves promptly. Of the 572 Rh-negative women (56 primiparae) delivered in the 3-year period under review 40 per cent of the babies received maternal blood, all having prophylactic cord transfusions at birth except 3 erythroblastotic infants transfused within a few days of birth. The remaining babies had no transfusion or had compatible donor's blood. Most of the premature babies were selected for maternal transfusion.

Of the 232 babies who received maternal blood, 2 had more than 50 normoblasts per 100 white cells and 5 had fewer than 4,000,000 red cells per c.mm. In 5 cases the haemoglobin was less than 100 per cent and 8 of the infants were jaundiced. Ten of the 13 babies diagnosed as having erythroblastosis received maternal cord transfusion (20 to 50 ml.) at birth and 4 of them later received Rh-negative donor blood without reaction (125 to 215 ml. in one or two transfusions). The other 3 infants were given intravenous maternal blood (80 to 90 ml.) several hours or days after birth and Rh-negative donor transfusion (90 to 100 ml.) in addition. There were Rh anti-bodies in the mother's serum in 2 cases, with a weak titre in one case and a titre of 1 in 80 in the other several days after delivery. All except 1 of the babies weighed over 6 lb. (2.7 kg.), and the author judges that premature induction of labour when erythroblastosis is anticipated is not justified. All infants receiving maternal blood survived, although the 13 mothers had previously had only 20 surviving children out of 31 pregnancies.

Eighteen cases of erythroblastosis were diagnosed in the control group of 340 infants of Rh-negative mothers not receiving transfusion of mother's blood. One died before transfusion could be given.

In the remaining 17 cases there were 4 deaths. Five babies had more than 50 normoblasts per 100 white cells, and red cells were fewer than 4,000,000 per c.mm. in 5 cases. Twelve babies were jaundiced. The 17 mothers had had 19 living children out of 25 pregnancies. The 17 babies described received 20 to 505 ml. blood from Rh-negative donors in one to seven transfusions. Two of the fatal cases were given 20 and 25 ml. respectively. The third infant died 9 hours after an 85-ml. transfusion which had caused a severe reaction; the fourth, with a high normoblast count, survived only a day after transfusion of 105 ml. of Rh-negative blood. In the group of 572 Rh-negative mothers 23 Caesarean sections were performed for various reasons. The author considers that immediate transfusion of the infant is preferable to abdominal delivery.

During the years 1936–42, father's blood was given in 10 cases for blood dyscrasia. There were 4 deaths in the neonatal period, and it is apparent from the case reports of the others that the paternal blood regularly precipitated the fall in haemoglobin level. Six cases are tabulated of suspected blood dyscrasia amongst the infants of 5,917 Rh-positive women, but the evidence appears insufficient to warrant a diagnosis of erythroblastosis in any of them. Five received maternal and 1 donor blood. All recovered. The author considers that breast feeding is advisable for erythroblastotic infants.

[The study of the Rh factor in obstetrics has been approached from many angles and this is indeed a novel one. An enormous amount of work has been done in this investigation, but how far has it advanced our knowledge? Few people would deem it advisable to transfuse all infants of Rh-negative mothers unless the serum has been tested for antibodies. Such serological data are scarcely mentioned in this report, and the diagnosis of erythroblastosis is made on very slender evidence in some cases. The results, too, are unconvincing, since several of the infants given maternal blood also had transfusions of large quantities of Rh-negative donor blood. These infants may well have survived in spite of, not because of, 20 to 50 ml. of maternal blood. In the group not given maternal blood the cases cannot be regarded as adequate controls, because 3 out of the 5 fatal cases had a maximum of 25 ml. of donor blood. The author's opinion that Caesarean section is not advisable and that breast feeding is not harmful in erythroblastosis is now shared by many people.]

Doreen Daley

1215. **A Graphic Method of Prognosis for the Infant in the Antenatal Care of Rh-isoimmunized Pregnant Women.**

By T. PRIMROSE, G. J. E. VAN DORSSER, and N. W. PHILPOTT. *Amer. J. Obstet. Gynec.*, **54**, 662–667, Oct. 1947. 5 figs., 4 refs.

An analysis has been made of the results of Rh tests on all pregnant women (4,569) referred to the authors' laboratory service during 1946. From observations of the infants born to these mothers the authors have devised a means of determining the prognosis for the baby during pregnancy. Agglutinating and blocking antibodies were sought in the sera of the Rh-negative mothers; when they were present the titre was estimated at frequent intervals throughout the pregnancy. Of the 2,960 clinic cases 33 were found to be immunized (1.12 per cent).

The grading used was as follows. Grade (1): only slight immunization in later weeks of pregnancy. Babies do well even without treatment in the immediate post-natal period. Grade (2): antibodies appear late. Blocking-antibody titres do not rise in the last few weeks of pregnancy above a dilution of 1 in 8. These babies are born at term showing some clinical signs of erythroblastosis of modern severity. The blood picture at birth confirms this. Infants are usually easily saved by transfusion. Grade (3a): a sharp rise in blocking antibodies to a dilution of 1 in 32 is often followed by a sudden drop in the last 2 weeks. Babies are severely damaged, but may be saved by prompt action immediately after birth. Grade (3b): antibodies are demonstrable relatively easily in pregnancy, the titre rising to 1 in 32 with sometimes a sharp drop in the last 2 weeks. Prognosis for the baby is very poor. Babies are often stillborn at term. Grade (4a): a very sharp rise in the later months to and above a dilution of 1 in 64 with some agglutinating antibodies. Prognosis is very poor for the baby; severe anaemia with oedema develops and the infant is usually stillborn at term or a week or so before. Grade (4b): antibodies first appear in heavy concentration at about the period of theoretical viability. A macerated foetus is usually born several weeks before term. Grade (5): blocking antibodies (sometimes with agglutinating antibodies) appear in appreciable concentration at dilutions of 1 in 4 and over, before the twentieth week. Prognosis is hopeless in the case of an Rh-positive baby. Abortion results. The future prognosis with a homozygous Rh-positive husband is likely to be uniformly poor.

The authors have found that, in practice, results have corresponded to the forecast except in 1 case where the husband was heterozygous. They advise Caesarean section a few weeks before term in some cases relegated to Grades 1 and 2, but doubt if this added maternal risk is justifiable in other grades. They do not consider that further pregnancies should be attempted when the mother is Grade 4 or 5, and the husband homozygous positive. Recently methionine has been given orally to the mother during pregnancy and to the infant in the neonatal period in cases where there is evidence of isoimmunization. Results are encouraging, but further trial is necessary before they can be evaluated.

[It would be interesting to see this method of prognosis applied to a larger series of cases,

because the view of some other workers in this field is that the outcome does not invariably depend on the antibody level. The only individual case report included in this paper briefly refers to a woman with blocking antibodies who was delivered of an Rh-negative infant.] *Doreen Daley*

1216. **Studies in Erythroblastosis Fetalis. I. Activation of the Incomplete Rh Antibody by the Blood Serum of Full-term and Premature Newborn Infants.**

By E. WITEBSKY, M. I. RUBIN, and L. BLUM. *J. Lab. clin. Med.*, **32**, 1330–1338, Nov. 1947. 10 refs.

It has been reported that the serum from umbilical cord blood, unlike adult serum or 30 per cent albumin solution, fails to agglutinate Rh-positive red cells treated with the incomplete or blocking-Rh antibody. This difference has been used to explain the delayed onset of symptoms of haemolytic disease of the newborn in cases where there is free antibody in the cord serum. The authors report studies on the agglutinating power of cord serum obtained from premature and full-term infants and from infants 24 and 48 hours old, and make a comparison with adult serum

There is great variation in the agglutinating power of cord serum, some samples being almost as active as adult serum, others almost inactive; sera from premature infants were consistently of low activity, while those from infants 24 to 48 hours after birth were more active than cord serum. The authors support Wiener's view that there is an activating principle, absent in premature infants and increasing in concentration during late foetal and early post-natal life, which is important in the development of manifestations of haemolytic disease of the newborn, and agree that premature induction of labour may prove a valuable therapeutic agent. It appears possible that transfusion of adult blood may supply enough activating principle to cause the symptoms to appear.

G. Discombe

1217. **Studies in Erythroblastosis Fetalis. II. Investigations on the Detection of Sensitization of the Red Blood Cells of Newborn Infants with Erythroblastosis Fetalis.**

By E. WITEBSKY, M. I. RUBIN, L. M. ENGASSER, and L. BLUM. *J. Lab. clin. Med.*, **32**, 1339–1349, Nov. 1947. 8 refs.

The cells of some Rh-positive infants suffering from haemolytic disease of the newborn are not agglutinated by complete Rh antisera if they are suspended in saline, but are agglutinated when suspended in adult serum, whether or not this serum contains Rh antibodies; cord serum from the patient and 20 to 30 per cent albumin solution fail to cause agglutination. This test for sensitization by the blocking Rh antibody can be used either in tubes or on the tile, but appears slightly more sensitive on the tile. The method has been employed to follow the progress of exchange transfusions. Oxalated normal plasma may replace adult serum in the test, but is apt to cause rouleau formation. [This application of the conglutination method appears simple and rapid.]

G. Discombe

1218. **Iso-immunization by A and B Blood Factors.** (Over iso-immunisatie door A en B bloedfactoren.)

By L. DE KROMME and L. A. M. VAN DER SPEK. *Maandschr. Kindergeneesk*, **15**, 303–313, Sept. 1947. 3 refs.

Iso-immunization with A or B factors can occur after transfusions of incompatible blood, but may also take place in the so-called hetero-specific pregnancies in which mother and child belong to different "hetero-specific" blood groups. The question arises whether such a blood-group incompatibility can have harmful effects on the foetus. Von Oettingen and Witebsky consider that blood-group substances are not present in the chorionic villi, so that the placenta forms a neutral zone between mother and child and the iso-antibodies of the mother are prevented from reacting with the blood-group substances of the foetal cells. The fact that anti-A and anti-B antibodies are normally present in the mother's plasma makes the recognition of pathological cases of iso-immunization by A and B antigens more difficult and involves quantitiative determinations of anti-A and anti-B antibodies. Since the clinical symptoms of an A or B sensitization are often not very striking many cases undoubtedly escape detection.

In 42 cases of jaundice in the newborn published by Wiener, Rh-Hr factors were not a contributory cause of the sensitization, but incompatibility of the ABO blood groups was established 34 times. In a control series of 2,000 normal newborn infants Halbrecht found only 530 whose blood group was incompatible with that of the mother. Moreover, in a series of 10,000 newborn infants Halbrecht found 10 with a mild icterus. In this condition, described by him as icterus neonatorum praecox, the jaundice developed shortly after birth. Sometimes the icterus was accompanied by slight anaemia. The children were not seriously ill; the liver and the spleen were not enlarged and there were no haemorrhages. In 57 of these cases an incompatibility of the blood groups existed. Apart from cases of mild icterus and of congenital anaemia, incompatibility of ABO blood groups may play a part in the causation of typical erythroblastosis foetalis. In erythroblastosis in children of Rh-positive mothers the blood groups ABO of mother and child appear to be incompatible in most cases.

Of the authors' 10 cases of A or B sensitization 3 are quoted. In the first the infant had multiple petechiae, an enlarged spleen, and slight icterus. The mother appeared to be Rh-positive and had the blood formula R_1-B-MN. Her 3-day-old serum strongly haemolysed blood cells of group A. The

serum was examined for possible Rh-Hr antibodies of the types anti-E, anti-c, anti-d. It did not react with R_1R_2 and rr erythrocytes, so that the mother had not been immunized by either Rh or Hr factors. The anti-A agglutinin titre was 2048. The child belonged to group A (R_1–A–MN), and the clinical phenomena were the result of an iso-immunization of the mother (B) through the blood cells of the child (A). In the second case a routine examination of the family showed that mother and child were Rh-positive; the father was Rh-negative. No antibodies against Rh-negative cells (cde/cde) could be shown in the mother's serum. The ABO types of mother (O) and child (B) were incompatible. The titre of anti-B bodies in the mother's serum was 1,024; the titre of anti-A bodies (32) was normal. The clinical report showed that the child's body was covered with haemorrhages at birth, and that 12 hours later a definite icterus appeared. Liver and spleen were enlarged. (The mother had had an attack of rubella in the second month of pregnancy.) In the third case the infant at birth had haemorrhages all over the body, especially numerous on the trunk, the spleen was enlarged. The mother had had rubella in the third month of pregnancy. Both parents were Rh-positive. The blood group of the mother (O) and that of the child (A) were incompatible. Two months after parturition the mother's blood showed a titre of 256 for anti-A antibodies, which is higher than normal.

Probably there is some connection between the occurrence of rubella and of other infectious diseases during pregnancy, the iso-sensitization of the mother, and the clinical signs in the child. In cases of congenital abnormality, especially if there is a history of infectious disease during pregnancy, the blood groups should be determined. If the blood groups are incompatible the antibody-titre of the mother's serum must be estimated. Man appears to be more sensitive to A and B antigens than to the Rh factor. In cases of Rh antagonism between mother and child the A or B antigens of the foetus may suppress the action of the Rh antigens. *B. L. Frank*

1219. **Breast-feeding in Erythroblastosis Foetalis.**
By I. A. B. CATHIE. *Brit. med. J.*, **2**, 650, Oct. 25, 1947. 3 refs.

Rh antibodies are commonly found in the breast milk of mothers who have borne erythroblastotic babies. It has been suggested that ingestion of this milk may have a deleterious effect on the recovery of an infant whose blood cells have already been subjected to the action of this antibody. The author describes experiments carried out to disprove this hypothesis.

Fasting gastric contents were obtained from 20 babies, aged from 1 week to 1 year; a wide range of gastric acidity was present. Equal volumes of gastric secretion and serum with a high Rh-antibody titre were incubated together for 1 hour at 37° C. No fall in antibody titre was noted in any case, indicating that Rh antibodies are not readily destroyed by gastric juice. In an attempt to demonstrate absorption from the stomach, serum containing antibodies was fed by mouth. Blood samples were taken afterwards and tested for antibodies. The indirect method, which is more sensitive than the ordinary test, was used. An Rh-positive volunteer drank 15 oz. (426 ml.) of a serum with an anti-Rh titre of 256. Twelve Rh-positive infants suffering from such conditions as inoperable spina bifida were fed for a complete day with high-titre serum. In none of these cases was sensitization of the cells demonstrated, nor did the serum sensitize other Rh-positive cells. A direct Coombs test was performed daily on a baby with erythroblastosis. The test became negative on the third day. On this day and for a subsequent 24 hours only high-titre serum was fed. Again no sensitization of the red cells occurred and no antibody could be demonstrated. A similar experiment with breast milk with an anti-Rh titre of 32 gave a similar result. To complete the series the observations were repeated on babies with haemolytic disease, the incomplete or blocking antibody being used. Again no evidence of absorption was found.

The author concludes that although Rh antibodies are not apparently destroyed in the stomach no evidence exists that they are absorbed into the blood stream. The weaning of babies with erythroblastosis because the breast milk contains antibodies is therefore not justifiable and these babies should, wherever possible, be breast-fed.

[This is important work in the field of erythroblastosis. Weaning of a newborn baby is always undesirable and more so in a case where the baby is ill or premature. The author appears to have produced conclusive evidence that it is safe to continue breast-feeding in these cases, even when antibodies can be demonstrated in the breast milk.]
Josephine Barnes

1220. **Exchange Transfusion in Erythroblastosis.** (La sustitución de la sangre en el recién nacido con eritroblastosis.)
By H. L. COFRE and M. SCHEPELER. *Rev. chil. Pediat.*, **18**, 733–755, Oct. 1947. 32 refs.

1221. **Exchange Transfusion for Erythroblastosis Fetalis.**
By A. W. CAVINS. *J. Indiana med. Ass.*, **41**, 214–215, Feb. 1948. 2 refs.

1222. **Technique of Suckling.** (Stilltechnik.)
By W. R. MERZ. *Praxis*, **37**, 178–182, Mar. 11, 1948. 1 fig.

1223. **The Adequacy of Artificial Feeding in Infancy.**
By S. S. STEVENSON. *J. Pediat.*, **31**, 616–630, Dec. 1947. 39 refs.

The common objections to cow's milk as an infant food are criticized. The only valid objection to artificial feeding accepted by the author is the higher morbidity and mortality rate associated with it. The author presents a record of 263 infants in

their first year of life. The average number of respiratory infections per infant in the breast-fed was 1.56 as against 2.18 in the artificially fed, and respiratory infection accounted for 85 per cent of all infections. The difference in incidence of respiratory infection is greater in the second half-year of life. There was no significant difference between the two groups as regards gastro-intestinal and other infections.

The vitamin contents of cow's milk are compared with those of breast milk; the latter has a relative abundance of vitamin A and ascorbic acid, and it is suggested that vitamin A may be stored in a breast-fed infant's body and so enhance his resistance to respiratory infection. A similar claim is made for ascorbic acid, and a case is made out for giving larger doses of both, beginning at birth. The dose of vitamin A should be 220 i.u. per pound (0.45 kg.) body weight daily and of vitamin C 100 mg. per day. There is evidence that an infant absorbs both these vitamins better when he is breast-fed, and that they may be the substances which confer greater resistance to respiratory infection in the second 6 months of life.

[This is an interesting paper because it illustrates the trend of thought in the United States in relation to the value of breast-feeding, but the author's statement that there is no significant difference between breast-fed babies and those receiving correct artificial feeding in the incidence of diarrhoea and miscellaneous infections would be challenged by many paediatricians in Britain.]

A. G. Watkins

1224. **Fetal and Neonatal Mortality: Causes and Prevention.**

By W. F. MENGERT. *Amer. J. Obstet. Gynec.*, **55**, 660–668, Apr. 1948. 21 refs.

1225. **Fetal and Maternal Mortality. An Eleven-year Survey.**

By N. S. ASSALI and L. F. ZACHARIAS. *Amer. J. Obstet. Gynec.*, **54**, 651–661, Oct. 1947. 6 figs., 9 refs.

The authors have analyzed the statistics of over 15,000 deliveries during an 11-year period and have studied the foetal and maternal mortality in this group.

During the second half of the period deliveries were on the whole supervised by obstetricians and rules for delivery, including performance of Caesarean section and the use of high forceps, were laid down. During this latter period, there was a marked reduction in foetal and maternal mortality, which supports the authors' plea that deliveries should be carried out by obstetric specialists and not by general practitioners. The causes of death resemble those already published in other investigations of maternal deaths, haemorrhage and shock being responsible for 28 per cent, infection for 25 per cent, and toxaemia and cardiac diseases for 18 per cent each. Only 1 death was attributed to frank puerperal sepsis. Foetal mortality was again highest among premature infants, while the lowest incidence of foetal deaths occurred in forceps delivery. The authors feel justified in condemning the use of high and mid-forceps, but stress the value of low forceps as a method of choice. Breech deliveries accounted for over 17 per cent of foetal deaths in this series.

E. D. Grasby

1226. **Clinical and Statistical Study of Foetal and Neonatal Death.** (Contributo clinico-statistico allo studio della nati-neonatimortalità.)

By T. NOBILE. *Ginecologia, Torino*, **14**, 20–31, Jan. 1948. 8 refs.

1227. **Foetal Mortality due to Deficiencies in the Practice of Obstetrics by Midwives.** (La mortinatalidad de responsabilidad previsible en relación con deficiencias en la aplicación directa del arte obstétrico por parteras en maternidades.)

By J. B. GONZÁLEZ. *Obstet. Ginec. lat.-amer.*, **5**, 69–93, Mar.-Apr. 1947.

In this article, which is one of a series dealing with the factors responsible for foetal mortality in a municipal hospital in Buenos Aires over a period of 10 years, the author discusses the findings in the babies born to those multigravidae who were attended by midwives under the control of an obstetrician. In this group there were 99 foetal deaths for which obstetrical factors were responsible, out of a total number of 526 investigated. Premature babies (weighing between 1,600 and 2,990 g.) provided 61.6 per cent of all cases. Investigation of the length of labour showed that in 46.46 per cent the limit of 12 hours, which the author considers to be the maximum time for normal labour in multigravidae, was exceeded. Face presentations were found in 2.02 per cent of cases and breech presentations in 18.17 per cent, compared with the usual figures of 0.5 and 2 per cent respectively. The influence of antenatal treatment is shown by the fact that out of a total foetal mortality rate of 2.86 per cent among the patients in this group, only 0.8 per cent represented the loss in those admitted before labour started, while 2.06 per cent occurred in those patients admitted in labour. Obstetrical practice should consist in making a physiological process of pregnancy and labour rather than in correcting complications.

Bryan Williams

MATERNAL MORBIDITY AND MORTALITY.

1228. **Motor Disturbances of Nervous Origin after Delivery (Neuritis of the Lumbo-sacral Trunk).** (Troubles moteurs d'origine nerveuse consecutifs a l'accouchement. Nevrite du plexus sacré (Tronc lombo-sacré).)

By J. BRET. *Rev. franç. Gynéc.*, **42**, 354–364, Dec. 1947. 1 fig., 10 refs.

1229. **Paralysis of the External Popliteal Nerve after Labour.** (A propos des paralysies du sciatique poplité externe dans le post-partum.)
By P. LANTUEJOUL. *Gynéc. et Obstét.*, **47**, 58–59, 1948. 1 ref.

1230. **A Study of Maternal Mortality in Canada.**
By M. KERR. *Amer. J. Obstet. Gynec.*, **55**, 396–402, Mar. 1948.

1231. **A Study of Maternal Deaths in the Philippine General Hospital.**
By A. BAENS. *J. Philippine med. Ass.*, **34**, 75–81, Feb. 1948. 5 refs.

1232. **Maternal Mortality in the South. An Analysis of One Hundred and Seventy-five Deaths.**
By F. R. LOCK. *Sth med. J.*, **41**, 228–237, Mar. 1948. 10 refs.

OBSTETRIC OPERATIONS.

1233. **The Use of Forceps in Obstetrics.**
By W. L. THOMAS. *Carolina med. J.*, **9**, 78–80, Feb. 1948.

1234. **Subcutaneous Symphysiotomy.** (La sinfisiotomía subcutánea.)
By L. GUILERA VALLHONRAT. *Med. esp.*, **19**, 89–94, Jan. 1948. 15 refs.

1235. **History of Caesarean Section in the Pre-antiseptic Period.** (Z historie cisarskeho rezu v době predanti-septické.)
By M. MATOUSEK. *Ceskoslov. Gynaek.*, **13**, 81–101, 1948. 12 refs.

1236. **The Changing Trends in Cesarean Section. Analysis of Cesarean Sections Performed in Detroit in 1925, 1930 and 1945.**
By H. C. MACK and R. S. SIDDALL. *J. Michigan med. Soc.*, **47**, 288–293, Mar. 1948. 4 refs.

1237. **Which Type Cesarean Section?**
By R. J. HEFFERNAN and C. L. SULLIVAN. *New Engl. J. Med.*, **238**, 241–248, Feb. 19, 1948. 8 figs., Bibliography.

1238. **Comparative Morbidity in Cesarean Section.**
By V. J. TURCOTTE and H. F. JARVIS. *J. Michigan med. Soc.*, **47**, 294–296, Mar. 1948. 18 refs.

1239. **Postmortem Cesarean Section Delivery of Twins, with Survival. (Case Report.)**
By F. H. DOBBS. *West Virginia med. J.*, **44**, 80–82, Apr. 1948. 6 refs.

1240. **Discussion on Anaesthesia for Caesarean Section.**
By R. C. THOMAS, J. H. PEEL, C. McI. MARSHALL, K. LLOYD-WILLIAMS, C. J. M. DAWKINS, J. N. CAVE, L. SNAITH, H. J. MALKIN, and J. B. COCHRANE. *Proc. roy. Soc. Med.*, **40**, 557–568, Aug. 1947. 6 refs.

Thomas discussed spinal analgesia. The requirements for an anaesthetic for Caesarean section are safety for the mother and child and operating ease for the surgeon. Provided that certain precautions are taken, spinal analgesia fulfils these conditions. The agent used is " nupercaine " (1 in 200), which is a quinoline derivative; thus the dangers arising from the pregnant woman's susceptibility to cocaine derivatives are avoided. The amount necessary is usually 2 ml., though less can be used for short women. Rigid asepsis ensures avoidance of meningitis, and care should be taken to avoid the solution arising above D8, or paralysis of the vasoconstrictors, bringing about a sudden fall in blood pressure, may occur. Ephedrine, gr. ¾ (48 mg.) is given beforehand; should the systolic pressure fall below 80 mm. Hg " methedrine ", 15 mg., is injected into the uterine muscle. The intrathecal injection is made with the patient lying on her side; she is then turned on to her back, the head and shoulders are raised, and the table is given 7 to 10 degrees head-down tilt. After 5 minutes the table is straightened and the operation can be started. The incidence of postoperative headache is minimized by using a fine needle, keeping the patient flat for 24 hours, and raising her very gradually to the Fowler position.

The advantages of this method are: (*a*) It is safe for the mother and easy to administer. (*b*) The amount of movement of the patient is small. (*c*) The patient can hear her child cry and see it almost immediately. There are no ill-effects on the child. (*d*) The surgeon has maximum ease of operating. (*e*) Convalescence is smooth; vomiting, distension, and chest complications are rare, but headache does occur. The series comprised 346 cases, 350 infants being delivered, with a salvage rate of 96 per cent. The majority of the operations were performed for disproportion.

Peel discussed caudal analgesia, which is not ideal but is very valuable and deserving of a more extensive trial than it has hitherto been given in Britain. The dangers of the inhalation and intravenous agents in causing foetal narcosis are well known; the disasters of spinal analgesia are obviated by the use of the extradural space. The method consists of the injection of 60 to 100 ml. of 1.5 per cent " metycaine " into the sacral canal through the sacral hiatus. Precautions are taken against tapping the subarachnoid space and against a too rapid injection of the fluid. The technical difficulty provides the main drawback to this method; 10 per cent of female sacra show anatomical abnormalities that may preclude successful use of this method, and a further 10 to 15 per cent of women have such large pads of fat over the sacrum that it is impossible to identify hiatus. Furthermore, it may be 20 to 40 minutes from the time of the injection to the moment when the patient is ready for the surgeon. When obtained,

the result is perfect. In a series of 51 cases there have been no maternal deaths or stillbirths; the 3 neonatal deaths were in no way related to the drug. The operation can be performed without hurry; the field is perfectly avascular and the baby cries immediately on delivery. It is not considered necessary to use either vasopressor or oxytocic drugs, but the patient is given morphine gr. ¼ (16 mg.) after the baby has been delivered, the usual premedication having been omitted. The Trendelenburg position can be used without danger and the post-operative course is smoother than after general anaesthesia.

McIntosh Marshall, in discussing local analgesia, said that there are many reasons why inhalational anaesthesia is dangerous in obstetrics. Premedication is cut down in the interests of the child, and for the same reason, the plane of anaesthesia is light; the risk of vomiting and aspiration of the stomach contents is very real. If the slight degree of anoxia which accompanies most inhalational anaesthetics is aggravated by laryngeal spasm or vomiting, this is quickly reflected in the child. When labour has been prolonged, uterine action is poor, the membranes have been ruptured for many hours, or foetal distress is evident; all these dangers are enhanced and general anaesthesia is contra-indicated. The choice lies between spinal and local analgesia; spinal analgesia is very near to being ideal, but mishaps and disasters can occur. Local analgesia is absolutely safe, and no tragedies arising from its employment in Caesarean section have ever been reported. Its use should be considered in all poor-risk cases, toxaemias, diabetes, pulmonary and cardiac disease, and in all cases of prematurity. If necessary, a small amount of "pentothal" (thiopentone) can be given just before the uterus is incised, without harm to the child. In the case of an uncorrected transverse position, the lower uterine segment should not be opened under local analgesia alone, as the back or an arm or shoulder may fall into the wound and extraction become almost impossible.

Records of Royal Free Hospital cases were discussed by Lloyd-Williams.

Ethyl-chloride-ether gave good results but entailed frequent resuscitation of the infant. Chloroform up to the delivery of the infant, followed thereafter by ether, did not appear to have such a depressant effect on the foetal respirations. With gas and oxygen it may be necessary to add some chloroform; this is preferable to increasing the amount of gas and oxygen; ether can be given after delivery. From the surgeon's point of view results with spinal analgesia were good. After operation paraldehyde 5 to 6 dr. (17.5 to 21 ml.) was given and postoperative distension was diminished by discouraging excessive intake of fluids. No deaths occurred in the series, though headache and backache were common in the early cases. When the lower-segment operation became more popular the use of spinal analgesia waned. The operation is more prolonged and the increased manipulation puts a considerable strain on the patient. Extraction appears to be more difficult because of contraction of the uterus. The present method is to give hyoscine gr. 1/200 (0.32 mg.) 1 hour preoperatively, followed by "pentothal", gas and oxygen. After delivery, "omnopon", gr. ⅓ (22 mg.) is given intravenously.

Dawkins said that at University College Hospital the best results were obtained from epidural analgesia, which had been used in 20 cases. Premedication consists of 100 mg. of pethidine given 1½ hours before operation and repeated ½ hour later. Pressor drugs are used only where there is a tendency for the blood pressure to fall. The patient lies on her side with the spine flexed, and the epidural space is entered between L2 and L3. Odom's indicator is attached to a Howard Jones needle, which is advanced slowly through the ligamentum flavum until the air bubble in the indicator is sucked inwards by the negative pressure in the epidural space; 10 ml. of "nupercaine", 1 in 600, is injected, with occasional aspiration to ensure that cerebrospinal fluid is not withdrawn. After an interval of 5 minutes the patient is asked to move her toes; if she can do so then the subarachnoid space has not been entered, and injection can proceed. A further 35 ml. is injected, the patient still being asked to move her toes and aspiration being repeated. The usual time interval for the production of analgesia is 25 minutes. All the babies breathed spontaneously. There were no headaches, chest complications, or urinary troubles. Relaxation was good, retraction of the uterus was satisfactory, and there was no postpartum haemorrhage. The postoperative state was good. The advantages of epidural block over spinal analgesia are that there is no risk of meningitis, the fall in blood pressure is less, and there is no headache.

Cave stated that of a series of 13 Caesarean sections performed with inhalation anaesthesia, there was some difficulty in establishing foetal respiration in 9, whereas of 15 performed with spinal analgesia, 14 infants cried as soon as the head was free. Spinal analgesia gives the best chance of a live child, with the least risk of postpartum haemorrhage.

Smith had used local analgesia supplemented by pentothal, cyclopropane, or gas-and-oxygen in 200 to 300 cases, and had found it satisfactory. Occasionally, however, the child which had started by crying well relapsed into a condition of collapse resembling white asphyxia.

Malkin had performed 736 Caesarean sections under spinal analgesia, in the majority of which light "duracaine" was used. There were 8 fatalities, none of which was attributable to the analgesic. *G. C. Steel*

1241. **General and Local Anaesthesia in Caesarean Section and the Risk of Foetal Anoxia.** (Les anes-

thésies générales et locales dans les opérations césariennes et le risque d'anoxie fœtale.)

By M. MAYER and —. JACQUEMIN. *Gynéc. et Obstét.*, **47**, 49–57, 1948.

1242. **Anaesthesia for Caesarean Section.** (Anestesie pri sectio caesarea.)

By L. SPINADEL. *Ceskoslov. Gynaek.*, **13**, 158–164, 1948.

1243. **Anaesthesia for Caesarean Section.** (Anestesie u císarskych rezu.)

By Z. MIRATSKA-TUMOVA. *Ceskoslov. Gynaek.*, **13**, 127–141, 1948. 21 refs.

MISCELLANEOUS.

1244. **The Renaissance of Eugenics in Italy.** (Per la rinascita dell'eugenica in Italia.)

By E. MORACCI. *Arch. Ostet. Ginec.*, **53**, 9–24, Jan.-Feb. 1948. 25 refs.

1245. **Obstetrics in the Small General Hospital.**

By C. E. CONNER. *Surg. Gynec. Obstet.*, **86**, 499–501, Apr. 1948. 4 refs.

1246. **Clinical and Statistical Data of Ten Years' Work at the Obstetric and Gynaecological Clinic of Bologna.** (Rilievi clinico-statistici sull'attività di un decennio nella clinica Ostetrica e Ginecologica di Bologna.)

By C. BELVEDERI and L. GIANAROLI. *Riv. ital. Ginec.*, **31**, 3–196, 1948. 9 figs. Bibliography.

1247. **Six hundredth Anniversary of Charles University in Prague. The Picture of Obstetrics and Gynaecology in this Period.** (Prace Puvodní. Porodnictví a gynaekologie na lékarské fakultě Karlovy university v Praze ja jejího 600 letého trvání (1348 az 1948).)

By M. MATOUSEK. *Ceskoslov. Gynaek*, **13**, 112–127, 1948. 34 refs.

1248. **Venous Thrombosis in Obstetrics and Gynaecology.** (Acerca das tromboses venosas em obstetríca e ginecologia.)

By M. QUEIROZ DE BARROS. *Rev. Ginec. Obstet.*, **1**, 150–166, Feb. 1948. 2 figs., 44 refs.

1249. **Perforation of the Posterior Fornix and Pouch of Douglas During Coitus.**

By S. LASK. *Brit. med. J.*, **1**, 786, Apr. 24, 1948. 2 refs.

GYNAECOLOGY.

General.

1250. **Rare Changes in the Bones of the Pelvis in Gynaecological Radiological Diagnosis.** (Seltenere Knochenveränderungen der Beckengegend in der frauenärztlichen Röntgendiagnostik.)

By H. DEUEL. *Gynaecologia, Basel*, **125**, 73–86, Jan.-Feb. 1948. 24 figs., 26 refs.

Disorders of Function.

1251. **The Characteristics of Uterine Bleeding following Cyclic Oral Therapy with Estrogen and Progesterone.**

By J. W. GOLDZIEHER, L. W. HAUS, and E. C. HAMBLEN. *Amer. J. Obstet. Gynec.*, **54**, 636–642, Oct. 1947. 4 figs., 8 refs.

The author investigated 86 patients suffering from functional disturbances of uterine bleeding to whom oestrogens alone or with progesterone were given from the fifth to the twenty-fifth day of the cycle. The latent period before the onset of hormone-withdrawal bleeding was carefully charted in each case, and was found to be shorter (mean 2.7 days) in the group receiving oestrogen-progesterone treatment than in those receiving oestrogen only (mean 5.4 days). This confirms the previous animal experiments. Patients with menorrhagia responded more quickly to oestrogen withdrawal than those in whom there was scanty bleeding, and tended to bleed longer. It was further observed that the latent period was not affected by increasing the dose of oestrogen or by the choice of synthetic or natural oestrogens. *E. D. Grasby*

1252. **Modern Views on the Hormone Treatment of Functional Disturbances of the Menstrual Cycle.** (Moderne vedute nel trattamento ormonale delle turbe funzionali del ciclo.)

By L. GIANAROLI. *Riv. ital. Ginec.*, **31**, 213–222, 1948. 3 refs.

1253. **The Value of Basal Body Temperature, Vaginal Smear, and Endometrial Biopsy in the Diagnosis of Functional Disturbances of the Ovary.** (El valor de la temperatura basal del cuerpo, frotis vaginal y biopsia de endometrio en el diagnostico de los trastornos funcionales del ovario.)

By J. ZANARTU ORREGO and A. ATRIA RAMIREZ. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 152–166, Aug. 1947. 10 figs., 24 refs.

1254. **Herpes Menstrualis.**

By N. A. ANDERSEN. *Gynaecologia, Basel*, **125**, 170–175, Mar. 1948. 7 refs.

1255. **A Case of Vicarious Bleeding into the Conjunctiva.** (Ueber einen Fall vikariierender Blutung in die Konjunktiva und blutiger Tränen.)

By K. HEYROWSKY. *Wien. klin. Wschr.*, **59**, 702–704, Oct. 24, 1947. 1 fig., 12 refs.

A case of vicarious menstruation in a married woman of 26 is reported. She had never had a period, but since the age of 16 had experienced cyclical bleeding from both conjunctivae. Five other members of the family had the same condition, but two also menstruated at the times of ocular haemorrhage. The patient had an adiposogenital syndrome and responded to treatment (change of occupation, diet, exercise, sex hormones) by menstruating normally and ceasing to bleed from the conjunctiva. *S. S. B. Gilder*

1256. **Dysmenorrhea.**

By E. T. MONTGOMERY. *Industr. Med.*, **17**, 94, Mar. 1948. 5 refs.

1257. **Dysmenorrhoea and Methyltestosterone.** (Dismenorrea y metiltestosterona.)

By R. PINEDA and G. CAMPAGNOLI. *Rev. esp. Obstet. Ginec.*, **7**, 52–56, Jan.-Feb. 1948.

1258. **Myometrial Physiology and its Relation to Pelvic Pain.**

By R. A. WOODBURY, R. TORPIN, G. P. CHILD, H. WATSON, and M. JARBOE. *J. Amer. med. Ass.*, **134**, 1081–1085, July 26, 1947. 5 figs., 11 refs.

Moir has observed that intrauterine pressure in dysmenorrhoea may reach levels exceeding the blood pressure. However, many excellent spasmolytics fail to relieve menstrual pain. The authors have investigated this anomaly with the aid of electro-uterograms by using small balloons fastened to ureteric catheters, intrauterine electrodes being preferred to extrauterine ones. Intravenous acetylcholine and histamine did not cause pain or show appreciable changes in uterine activity in either control patients or those with dysmenorrhoea. Intravenous "pitocin" in doses which induced definite uterine activity did not cause distress "Pitressin", however, in a dosage with one-twentieth the oxytocic activity of the pitocin previously given, produced distress, cramps, increased frequency and amplitude of contractions, and elevation of uterine tone in all 25 patients investigated. The rapidity of onset of the action of this drug is strong evidence in favour of its action being direct and not secondary to vasoconstriction. Apparently, bio-assay of these preparations is unsatisfactory. The suggestion is made that effective uterine antispasmodics must have an anti-pitressin effect on the uterus and that "trasentin" and "pavatrine" do not possess such power.

The effect of stretching the uterus by distension of the balloon was investigated; normal controls tolerated an average distension of 5 ml., while dysmenorrhoeal nulliparous patients tolerated an average of 3.5 ml. Pressure records showed that the contractions in the latter group of patients were co-ordinated with extremely high pressures (up to 340 mm. Hg), poorly co-ordinated with high pressures, or unco-ordinated with low pressures. Summation, refractory period, and tetany were demonstrated. The pressure at which pain was felt in different cases varied greatly.

When contractions were co-ordinated discomfort was usually felt at a pressure of 70 to 100 mm. Hg and distress at 140 to 180 mm. Hg. In the presence of incomplete or complete tetany, pain was always severe at much lower pressures; it was usually severe at pressures of 40 to 80 mm. Hg.

Pressure records at various levels of the uterus showed definite difference. The shortest contractions were observed in the region of the cervix, and the musculature of the dome of the fundus was the slowest to contract and relaxed even more slowly. From the fundus downwards the musculature was found progressively to contract faster and relax faster and more completely. Intrauterine debris is pushed out during relaxation and not during contraction. Disorganized contractions fail to propel menstrual debris downwards. In some patients the disorganized contractions lead to formation of a constriction ring, which further obstructs the outflow. Though myometrial activity is an important factor in producing distress of dysmenorrhoea, the amount of oedema, congestion, tissue fragility, heightened tissue irritability, and fibrinolysis of menstrual debris are also important.

[This is an excellent article, and it is to be hoped that the authors will by similar technique discover the most effective anti-pitressin drug for therapeutic use.] *Doreen Daley*

1259. **Rise in Blood Pressure as an Objective Sign for Pain, especially in Dysmenorrhoea.** (Blutdrucksteigerung als objektives Zeichen für Schmerzen, insbesondere für Dysmenorrhoe.)

By P. GERLACH. *Zbl. Gynäk.*, **69**, 396–400, 1947. 1 fig., 11 refs.

Any painful stimulus applied to a skin with normal sensation causes a rise in blood pressure. The same applies to spontaneous pain associated with such conditions as peptic ulcer or tabetic crises. Blood-pressure readings taken from 15 student nurses and midwives with painless menstruation showed that there is an average rise in systolic pressure of 5.6 mm. Hg in the premenstrual period and a fall of 5.6 mm. Hg during the menstrual flow, pressure again becoming normal at the end of the period. In 8 cases of dysmenorrhoea the rise above normal was 9.5 mm. Hg systolic and 8.7 mm. Hg diastolic, this rise coinciding with the days of severe pain. After these the blood pressure fell to physiological levels. Blood-pressure readings can be used as an objective sign of dysmenorrhoea if they are taken during a whole cycle. *L. Ganz*

1260. **Dysmenorrhea and Ovulation: Correlation of the Effect of Estrogen Therapy on Pain, the Endometrium, and the Basal Body Temperature.**

By L. W. HAUS, J. W. GOLDZIEHER, and E. C. HAMBLEN. *Amer. J. Obstet. Gynec.*, **54**, 820–828, Nov. 1947. 3 figs., 19 refs.

The authors have been impressed by the invariable relation of functional dysmenorrhoea to the presence of a progestational endometrium or to a basal temperature curve of ovulatory type.

Fifty-four unselected patients were studied over 228 cycles; 82 biopsies of the endometrium were taken and 11 basal temperature readings recorded. Oral therapy from the fifth to the fifteenth or from the fifth to the twenty-fifth days of the cycle consisted of from 5 to 60 mg. diethylstilboestrol and from 6.25 to 75 mg. "premarin" (oestrone sulphate). In considering results one complete relief of pain was taken as a standard. A total dose of less than 25 mg. premarin or less than 20 mg.

diethylstilboestrol was given to 33 patients, and of these 12 (36.4 per cent) obtained complete relief; 72.7 per cent had complete relief when the dose of premarin was raised from 50 to 75 mg. or that of diethylstilboestrol from 40 to 60 mg. "All anovulatory cycles were pain-free. All ovulatory cycles were accompanied by pain save in one instance in which an early progestational endometrium was associated with no pain." No gross disturbance of the cycle or other complication was seen as a result of treatment, which is only temporary and is not curative. The resulting temporary sterility does not impair subsequent ovarian function. This treatment should not be used for patients in whom pregnancy is desirable. The probable part played by progesterone in the causation of dysmenorrhoea is discussed.

G. Gordon Lennon

1261. **The Treatment of Amenorrhoea by Progesterone and its Possible Use in the Diagnosis of Pregnancy.** (Die Amenorrhoebehandlung durch Progesteron und ihre mögliche Ausnutzung zur Schwangerschaftsdiagnose.)

By P. CAFFIER. *Zbl. Gynäk.*, **69**, 10–25, 1947. 14 refs.

In treating amenorrhoea by corpus luteum hormone the author set out to determine: (1) the regularity with which bleeding could be produced; (2) whether the bleeding was true menstrual or of a pseudo-menstrual type; (3) the reliability of the method in the diagnosis of pregnancy; and (4) its influence on the psychological and physical condition of the women.

He injected on 5 consecutive days 10 mg. "proluton" (progesterone) with, in the later cases in the series, the addition of 1 mg. "progynon" (oestrone) on the same days. In the 30 cases treated the period of amenorrhoea varied from 2 months to 15 years; in every case bleeding was produced when proluton was given with progynon. When proluton alone was used there were 2 failures.

In only 1 case did the bleeding appear to be of a true menstrual type, as shown histologically. This patient, aged 24, had had amenorrhoea since her confinement 1 year previously. Regular rhythmical bleeding followed two courses of proluton. Spontaneous bleeeding occurred in only 4 of the 30 cases, some 4 weeks after the bleeding induced by proluton. In only 2 cases, the one already quoted and another with almost similar history, did regular cyclic bleeding persist. The author therefore concludes that the treatment is substitutional and that no stimulation of the ovary results. There were only 3 other cases in the series in which the endometrium was found to be in the secretory phase after proluton administration. In none of these cases could the possibility be excluded that the secretory phase might have been present before treatment. The author has observed a case in which the endometrium was found to be in the secretory phase after 7 years' amenorrhoea, although no treatment had been given; Lauterwein found the secretory phase to be present in 13.7 per cent of cases of secondary amenorrhoea.

In 26 of the cases treated the endometrium was either in the proliferative phase or atrophic. The author discusses (mainly theoretically) the uniformity of the capacity of the uterus for bleeding despite the variability of the endometrical picture. He concludes that bleeding is the standard reaction of the uterus to stimulation, either by sex hormones or through nervous pathways, especially through the sympathetic nervous system.

The author decided to assess the value of a course of proluton in cases of secondary amenorrhoea where the presumptive diagnosis was early pregnancy, anticipating that no bleeding would occur. In 30 such cases no bleeding occurred. Proluton was given in 3 cases of disturbed pregnancy: (1) A multipara, 4 months' pregnant, was admitted to hospital with a high temperature and vaginal bleeding; after a course of proluton bleeding ceased and the patient was subsequently delivered at term of a living child. (2) A patient, who complained of irregular menstruation for 6 months, had a soft uterus, enlarged to the size of a 2 to 3 months pregnancy. After proluton there was profuse bleeding; a curettage was performed and the products of a missed abortion were removed. (3) A patient with 2 months' amenorrhoea had lower abdominal pain and slight vaginal bleeding. Proluton was given, but on the third day there was marked bleeding, which continued until operation 2 weeks later, when a tubal pregnancy was treated. It is concluded that proluton may justifiably be used without danger in secondary amenorrhoea and may help in the diagnosis of pregnancy.

The author tried to assess the value of proluton in relieving the nervous symptoms, headache, languor, and disability which often accompany secondary amenorrhoea. Although proluton produces bleeding only once, this occurrence has a good psychological effect on the woman, and many of the other symptoms disappear or are considerably improved.

Gladys Dodds

1262. **Mechanism of Action of Block of the Superior Cervical Ganglion in Amenorrhoea.** (Nouvelles études sur le mécanisme de l'action des infiltrations du ganglion cervical supérieur dans les aménorrhées.)

By A. NETTER. *Sem. Hôp. Paris*, **24**, 296–297, Feb. 6, 1948.

The authors have already published observations on the use of procaine infiltration of the superior cervical ganglion in gynaecological disorders. The theoretical basis for this is that this ganglion represents the sympathetic nerve supply of the pituitary gland, and that disorders of pituitary origin may be improved by the vasomotor or trophic changes resulting from this procedure. Endometrial biopsies have revealed that procaine injection of the superior cervical ganglion in favourable cases

causes ovulation. The method has been used in cases of amenorrhoea, anovular bleeding, and sterility due to failure of ovulation. In cases of amenorrhoea some of the successes that have been achieved must be attributed to other causes, since bleeding occurred too soon for there to have been a formation of secretory endometrium. Four cases of amenorrhoea are described in which bleeding started very shortly after the injection and must have been of an anovulatory type. In 2 other cases endometrial biopsy revealed non-secretory endometrium, although bleeding took place some time after the injection. In 1 case regular cyclical haemorrhage followed the injection. This treatment, therefore, appears to cause anovular uterine haemorrhage, the mechanism of which is obscure. It is necessary to use a bilateral infiltration. Unilateral infiltration was ineffective.

Josephine Barnes

1263. **Amenorrhoea as a Result of Psychic Traumata.** (Brak miesiaczki spowodu przezyc psychicznych.)

By W. MAJOR. *Polsk. Tyg. lek.*, **2**, 990–993, Sept. 1947.

1264. **The Use of High Voltage Roentgen Therapy in the Treatment of Amenorrhea and Sterility in Women.**

By I. I. KAPLAN. *Amer. J. Roentgenol.*, **59**, 370–377, Mar. 1948. 13 refs.

1265. **Diagnosis and Treatment of Amenorrhoea.** (Diagnostic et traitement des amenorrées.)

By M. C. BECLERE. *Rev. Ginec. Obstet.*, **1**, 115–127, Feb. 1948.

1266. **Intravaginal Implantation of Hormone Pellets.**

By B. ZONDEK. *Lancet*, **2**, 423–424, Sept. 20, 1947. 3 figs., 10 refs.

Rate of absorption is a decisive factor in activity of hormones given therapeutically. To prolong the hormonal action it is necessary to prevent rapid absorption from the site of the injection. Esters can be used to achieve this result in oestrogen therapy, and in recent years subcutaneous implantation of pellets has been tried with the purpose of prolonging the effect further. The author found that in some cases treated in this way results were unsatisfactory because fibrosis resulted in encapsulation of the pellets, which were thus rendered ineffective. He has shown experimentally that the activity of the oestrogenic hormone was greatly increased when the hormone was injected near its target organ—that is, in the vaginal mucosa. The dose of oestrone necessary to elicit oestrus by the intra-vaginal route is only a fifth of that required by the subcutaneous and intramuscular routes. The author has implanted hormone pellets intravaginally in 200 cases of menopausal and menstrual disorders, and claims that the advantages of this site compared with subcutaneous tissue are: smoother absorption, 5 to 6 times greater effect, and much slighter risk of expulsion. He describes the technique as follows:

"After disinfection of the vulva and vagina with an antiseptic cream of 1.5 per cent *p*-chloroxylenol ("dettol" or "bazylan") a wheal is produced in the posterior wall of the vagina 2 to 3 cm. above the introitus vaginae by injection of 1 to 2 ml. of a 0.5 per cent procaine and adrenaline solution. A Kocher clamp is attached to the wheal so that the posterior vaginal wall can easily be drawn forward. The submucosa over the Kocher clamp is infiltrated with procaine, a total of 5 to 10 ml. being given. About 1 to 2 cm. above the clamp a second clamp is applied and a cross incision, 1 cm. long, is made into the vaginal mucosa with scissors. The superior and inferior mucosal borders are then each fixed with Kocher clamps and slightly stretched apart. The vaginal mucosa is lifted from the fascia with a bent clamp, a procedure greatly facilitated by the infiltration with procaine and adrenaline. A hollow space is thus formed in which two or three pellets can readily be implanted at different points. The implantation is made with a glass tube about 3 mm. in diameter in which the pellets lie. They are expelled from the tube in the correct location with the help of an inner rod. The wound is closed with two or three catgut stitches. The patient is kept under observation in the clinic for half an hour for possible after-effects of procaine and adrenaline, and in released at the end of this time with advice to rest for a day or two. In rare cases in which bleeding has taken place a vaginal tampon has been inserted."

The clinical effects are evident 3 to 4 weeks later and their duration depends on dosage. Ten months' alleviation of menopausal symptoms can be obtained by 50 mg. of oestradiol. Progesterone, testosterone, and desoxycorticosterone acetate can be implanted in the same way.

The pellets were produced by hand-pressing 10 to 25 mg. of hormone in a brass-tube box, 2.5 mm. in diameter, with a brass piston. The pellets had a diameter of 2.5 mm. and a thickness of 1 to 3 mm.; they were sterilized by dry heating at 100°C. for 24 hours.

Doreen Daley

1267. **Treatment with Oestrogen Implants.** (Ensayo sobre terapeutica con pellets de estrogenos.)

By A. ERNST MARTINEZ. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 262–272, Oct. 1947. 14 figs., 6 refs.

1268. **A Clinical Evaluation of Dienestrol, a Synthetic Estrogen.**

By A. E. RAKOFF, K. E. PASHKIS, and A. CANTAROW. *J. clin. Endocrinol.*, **7**, 688–700, Oct. 1947. 11 refs.

The authors present the results of a clinical study on the synthetic oestrogen, dienoestrol (4,4′-dihydroxy-γ-δ-diphenyl-β,δ-hexadiene). The objects were to determine the relative usefulness of dienoestrol in oestrogen therapy, to evaluate the oestrogenic response, and to determine possible toxic effects.

Dienoestrol was given in gradually increasing dosage to 40 patients with menopausal symptoms. Slightly over half the patients required a daily dose of 0.5 mg. to control symptoms, but mild symptoms in all cases and moderate symptoms in one-third of the cases could be controlled with 0.1 to 0.3 mg. daily. In 10 per cent 1 mg. was required to control symptoms. The dose needed to obtain a vaginal-smear response was greater than that required to control symptoms. For the treatment of atrophic vaginitis, doses of up to 3 mg. daily were needed, but excellent results were obtained with the local application of a vaginal cream containing dienoestrol. Daily application of 0.5 mg. gave a good clinical and vaginal-smear response in 1 week. Bleeding during treatment or on withdrawal was unusual. Inhibition of lactation was successfully accomplished in 26 women, with a dose of 0.5 mg. twice daily for 3 days, followed by 0.5 mg. daily for 1 week. Treatment of amenorrhoea in young women was less sucessful; dienoestrol was inferior to stilboestrol for this purpose. In spasmodic dysmenorrhoea and in other conditions, such as cystic mastitis, effects comparable to those of stilboestrol were obtained. There was no clinical or laboratory evidence of toxicity—nausea, vomiting, and headache being absent. No significant effect was noted on the blood or on hepatic or renal function in patients receiving treatment for prolonged periods, in some cases as long as 16 months.

Dienoestrol seems to be particularly effective in controlling the vasomotor and related symptoms of the menopause and for the inhibition of lactation. The explanation for this is probably that dienoestrol has a relatively marked inhibitory effect on the anterior pituitary, while stilboestrol acts more on the endometrium and vaginal mucosa. Dienoestrol is unique in that its oral potency is as great as, if not greater than, its potency by injection. The action is not prolonged, experimental oestrus in mice and rats lasting on an average for about 3 days. Dienoestrol is one of the best tolerated of all the synthetic oestrogens, and is now available as a relatively inexpensive product.

[A certain amount of work had already been done on dienoestrol, but further detailed studies were needed, and the present work is a valuable contribution. Dienoestrol has been found by British workers to be relatively ineffective in inducing withdrawal bleeding from the endometrium, compared with stilboestrol. The best results in the treatment of carcinoma of the prostate and elsewhere have been obtained with stilboestrol. That dienoestrol acts more as a pituitary inhibitor than directly on the endometrium may be the correct explanation. This work confirms previous opinions on the value of dienoestrol in two conditions in which inhibition of the anterior pituitary is to be preferred to a direct effect on the endometrium—menopausal symptoms, believed by many to be due to excess of pituitary gonadotrophic hormone, and the inhibition of lactation. The absence of toxicity when dienoestrol is used for menopausal symptoms is of great value. It seems likely that different uses will eventually be found for the various synthetic oestrogens.]

Josephine Barnes

1269. **Treatment by Male Sex Hormone and Luteal Hormone of Premenopausal Hormonal Disturbances.** (Les troubles hormonaux d'origine préménopausique. Leur traitemente par l'hormone mâle et l'hormone du corps jaune.)

By C. Beclere and H. Simonnet. *Rev. Ginec. Obstet.*, **42**, 191–201, Mar. 1948. 11 refs.

1270. **Menopausal Bleeding.** (Blutungen in der Menopause.)

By H. Husslein. *Klin. Med. Wien.*, **3**, 86–93, Feb. 1, 1948. 6 refs.

1271. **Postmenopausal Bleeding from Fibroids.**

By L. A. Day and J. H. Pratt. *Proc. Mayo Clin.*, **23**, 162–166, Mar. 31, 1948. 1 fig., 8 refs.

1272. **Haemorrhages After the Climacteric, Due to Hormone-producing Tumours.** (Metrorrhagi efter Klimakteriet som Følge af hormonproducerende Ovarietumorer.)

By A. Lachman. *Ugeskr. Læg.*, **110**, 436–438, Apr. 8, 1948. 3 refs.

1273. **Male Blood Transfusion in Functional Uterine Haemorrhage.** (La transfusión de sangre masculina en las metropatias hemorrágicas funcionales.)

By U. Matera. *Obstet. Ginec. lat.-amer.*, **5**, 304–312, July 1947. 12 refs.

Functional uterine haemorrhage can be effectively treated with progesterone and the androgens, but these hormones are expensive. Curettage is dangerous in patients with full genital activity. [No evidence is presented in support of this statement.] The author has therefore treated a series of 15 cases by transfusions of male blood, with the objects of supplying the male hormone and thus helping to control the hormonal balance, and of treating the anaemia. The ages of the patients ranged between 14 and 49, and total amounts of between 250 and 1,700 ml. were given, the number of transfusions varying between 1 and 8. Results were good, with restoration of a normal menstrual cycle.

[Only the immediate results are detailed, although the late results are said to have been satisfactory. No mention is made of Rh testing, which is desirable in all cases and essential in young patients and when multiple transfusions are given.]

Bryan Williams

1274. **Uterine Bleeding with Special Reference to the Functional Type.**

By E. Novak. *J. int. Coll. Surg.*, **11**, 9–16, Jan.-Feb., 1948.

1275. **Radiotherapy of Metropathias.**
By P. R. Rau. *Indian J. Radiol.*, **2**, 30–34, Feb. 1948. 2 figs.

Sterility.

1276. **Sterility.**
By R. M. Brannon. *Sth Surg.*, **14**, 195–201, Mar. 1948.

1277. **What Do We Know About Sterility?**
By L. W. Mason. *West. J. Surg.*, **65**, 119–123, Feb. 1948.

1278. **The Tubal Factor in Sterility.** (El factor tubario en la esterilidad.)
By A. Alvarez Bravo. *Rev. méd. Hosp. gen.*, **9**, 845–862, Aug. 1947. 32 figs., 22 refs.

In a series of 388 cases of sterility investigated in Mexico, tubal factors alone were found to be responsible in 68 cases and in combination with other factors in 94 cases. Infection is the most important cause. Genital tuberculosis always involves the Fallopian tubes. In a previous series of cases the author found that a puerperal infection was the cause in 21 per cent of cases of sterility, and that a postabortion infection was more dangerous than a postpartum infection. The gonococcus is the most important organism causing sterility. Insufflation with a kymographic apparatus should be the routine method of investigation when other factors have been excluded, and is valuable in demonstrating tubal contractility. Hysterosalpingography is also necessary. [A series of good kymographic tracings and hysterosalpingograms is reproduced.]

Treatment is by hormones and measures directed against infection, such as the use of pelvic heat and diathermy. Insufflation is of great therapeutic value; the author repeats it as often as 10 or 12 times, but does not advise salpingography as a routine method of treatment. Surgical treatment is carried out only if all the other factors are favourable. The various operative measures are described. Salpingolysis is apt to fail, as the adhesions re-form. In salpingostomy by circumcision a sleeve of tube is sutured back. In lateral salpingostomy an opening is made on the side of the Fallopian tube opposite to the mesosalpinx and may be kept open by the use of amniotic membrane. End-to-end anastomosis of the tube over pieces of catgut or a ureteric catheter passed through the uterine cavity into the vagina is a delicate and not very successful operation. Implantation of the Fallopian tube into the uterus may be carried out when there is obstruction at the uterine cornu. The Fallopian tube is divided and separated a little from its mesentery, and a sleeve formed and folded back. A ureteric catheter is then passed into its lumen and later into the uterus. The intersitial portion of the Fallopian tube is removed and a tunnel made into the uterus. The Fallopian tube is then drawn through this by means of the sutures which were used to form the sleeve and were left long; these are passed through the wall of the uterus and tied, and the peritoneal opening is closed by fine sutures. The ureteric catheter is removed from the vagina between the sixth and tenth days. Implantation of the ovary into the uterus is rarely successful. During operation tubal patency may be tested by the injection of saline or air into the lateral end of the Fallopian tube, or by the injection of saline into the lumen of the uterus, while the lower part of the uterus is compressed. After operation a careful insufflation is carried out on the tenth day, and is repeated monthly in the pre-ovulatory period. Hysterosalpingography is also performed.

The number of cases treated was 119 and the result in 25 of these is unknown. In 36 cases treated by insufflation 7 full-time pregnancies resulted and in 54 treated by insufflation and other measures 22 full-time pregnancies. In 4 cases treated by hysterosalpingography there were 3 full-time pregnancies, in 12 cases receiving surgical treatment 2 full-time pregnancies and in 13 cases treated by other measures 2 full-time pregnancies. Twenty-four live babies were born in 26 full-time pregnancies. There were also 8 abortions and 3 cases of ectopic pregnancy, 2 of which followed surgical treatment; in neither of these was there postoperative insufflation and both followed a first insufflation carried out in the pre-ovulatory stage.

Bryan Williams

1279. **Conception Following the Prediction of the Day of Ovulation with the Rat Test. A Study of Ten Patients.**
By D. P. Murphy and E. J. Farris. *Amer. J. Obstet. Gynec.*, **54**, 467–474, Sept. 1947. 3 refs.

This paper is a further evaluation of the rat test for ovulation previously described by one of these authors, and of value in the study of relatively infertile couples. By semen analysis the husband is classified (by criteria as yet to be published) as infertile, of low fertility, or highly fertile. In the absence of previous pregnancy, or laparotomy in the wife, the patency of the Fallopian tubes is determined by uterosalpingography. This is followed by timing of the day of ovulation.

The morning specimen of urine is collected on 10 consecutive days during the middle third of the menstrual cycle, and 2 ml. of urine is injected subcutaneously into each of 2 immature female white rats of the Wistar strain. Each animal is killed by illuminating-gas at the end of 2 hours. The abdomen is opened, the ovaries are drawn one at a time into the wound, and the colour of each is compared with the graded shades of red of the Munsell colour system. In the presence of normal ovulation, the patient's urine induces hyperaemia in the ovaries of the rat on 4 or 5 consecutive days. If ovulation is present but abnormal, hyperaemia is usually not present on 4 consecutive days. Intercourse is prohibited during the testing period of each month, since it adversely affects the colour reaction. No attempt at conception is advised during the first month of study. The authors find

that the ovum is ready for fertilization on the last day of the colour reaction. Intercourse should not take place on the days immediately before that on which the ovum is ready, otherwise the maximum number of spermatozoa will not be available on that day.

Ten women became pregnant when coitus or artificial insemination took place on the day of ovulation. All but 1 of these patients had previously had difficulty in conceiving. Some women, tested in many consecutive months, showed few normal ovulation reactions. This emphasizes the need for testing such women every month in order to discover the few times when they may conceive. The rat-ovulation test gives 2 or 3 days' warning of impending ovulation. This fact makes it possible to have the husband conserve his sperm cells for that day. If artificial insemination is intended, the test allows time for preparation and makes for economy when donor specimens are used. The test also renders unnecessary the performance of endometrial biopsy.

[The reader unfamiliar with this test will find a more detailed description in *Amer. J. Obstet. Gynec.*, 1946, **52**, 14.]

Anthony W. Purdie

1280. **Mucus, Sperm, and Infertility. Studies Concerning Human Cervical Mucus and Sperm Migration in Relation to Infertility.**

By A. R. ABARBANEL. *J. Mt Sinai Hosp.*, **14**, 729–738, Sept.-Oct. 1947. 2 figs., 20 refs.

In this investigation over 500 women were intensively studied and over 2,500 tests of sperm migration carried out both *in vivo* (post-coital) and *in vitro*. The *in vitro* tests followed the method of Lamar with the author's modification to eliminate the criticism that the bubble of air introduces extraneous factors. The results cover the cyclic changes in the cervical mucus in the normal cycle, and the changes in the cervical mucus in hysterectomized, bilaterally ovariectomized women with an apparently normal cervical stump under artificial stimulation with various hormones, including preparations of oestrin, progesterone, and testosterone.

In the first group the author noted changes in the volume and viscosity of the cervical mucus, beginning about the tenth or eleventh day of the cycle and reaching their climax about the fourteenth day and coinciding with the low point of the basal body temperature, the day of so-called "ovulatory dip" or temperature shift. The volume was seen to increase from twofold to as much as tenfold, with a marked decrease in viscosity; the mucus became glairy, translucent, and almost watery. Leucocytes disappeared. At this stage spermatozoa penetrated and migrated through the mucus easily, and in relatively large numbers. In the post-ovulatory phase (usually within 48 to 72 hours) the volume decreased markedly, the viscosity rapidly increased, and leucocytes returned. By the nineteenth day (5 days after the temperature shift) sperm could no longer invade the cervical mucus even if placed in direct contact with it for 24 to 48 hours. Menstrual fluid was found to be easily and rapidly penetrated by sperm, which remained active and motile for 24 to 48 hours in it.

In the second group (ovariectomized, hysterectomized women in whom the cervical stump was present) the administration of an active oestrin preparation produced results similar to those obtained in the first group, the time lag between the start of therapy and the production of the typical pre-ovulatory state of affairs ranging from 5 to 14 days. Progesterone when given alone had no effect, nor did testosterone preparations. When oestrin administration was followed by progesterone the results were similar to those in the normal post-ovulatory phase.

The author concludes that "the essential physiological role of the oestrin-induced pre-ovulatory changes in the cervical mucus is to provide, as W. Tyler Smith stated in 1855, a suitable medium for the passage of spermatozoa through the cervix uteri into the uterine cavity". From the clinical aspect he advises that the Smith-Sims-Huhner test should be carried out on the thirteenth or fourteenth day of a 28- or 30-day cycle. It is the author's practice to perform the test on the eleventh and fourteenth days and again on the seventeenth day if thought necessary, because in many women the time of the temperature shift may vary considerably. Cauterization of the cervix is also advised in cases of endocervicitis, because where infection is present there is a loss of fluid with increased viscosity and consequent decreased or absent sperm penetration. *E. L. Nicolson*

1281. **Semen Evaluation and Fertility.**

By E. F. HOFFMAN. *West. J. Surg. Obstet. Gynec.*, **56**, 155–156, Mar. 1948.

1282. **Infertility Associated with Masculinizing and Feminizing Syndromes.**

By S. J. GLASS. *West. J. Surg. Obstet. Gynec.*, **56**, 116–118, Feb. 1948. 9 refs.

1283. **The Importance of Disturbed Function of the Endometrium in the Treatment of Sterility. Investigation of 100 Cases by means of Curettage During Menstruation.** (Endometrium functio-zavarok jelentösege a meddöség gyógytásában (100 menses curettage vizsgálata).)

By E. SELMECI. *Orvosok Lapja*, **4**, 67–71, Jan. 18, 1948. 15 refs.

1284. **The Basal Temperature Curve in the Investigation and Treatment of Sterility.** (La gráfica de temperatura basal en la investigación y tratamiento de la esterilidad.)

By J. M. SALA PONSATI. *Med. esp.*, **19**, 124–130, Jan. 1948. 7 figs., 21 refs.

1285. **Treatment of Functional Sterility with Gonadotrophic Hormones.** (Behandling af Funktionel Sterilitet med gonadotrope Hormoner.)

By A. E. RYDBERG and V. MADSEN. *Ugeskr. Læg.*, **109**, 827–837, Nov. 20, 1947. 1 fig., 3 refs.

The authors report on the treatment of 52 cases of long-standing " functional "—that is, ovarian—sterility with standard courses of gonadotrophic hormone. They divide their cases into two principal types: those in which the sterility is accompanied by disturbances of menstruation, and those in which menstruation is normal. The former are classified as " functional " only if patients conceive within 6 months of treatment. Sixteen such cases are reported, but the total number treated is not stated. In each case the treatment comprised five consecutive daily injections of 3,000 i.u. of serum gonadotrophic hormone, followed by three injections on alternate days of 1,500 i.u. of chorionic gonadotrophic hormone. The immediate result in a typical case was a rise in the urinary oestrin from less than 30 milliequivalents per 24 hours to 450 milliequivalents per day in the space of 2 weeks. During the third week nearly 20 mg. of pregnanediol was excreted per 24 hours, and menstruation occurred 3 weeks after the start of treatment. In 5 cases, conception occurred at once; in the rest, within 6 months. The other type of case (in which there was no disturbance of menstruation) was only classified as " functional " after the exclusion by careful examination of anatomical causes of sterility and of sterility in the male partner. The diagnosis was confirmed if endometrial biopsy at the beginning of menstruation showed the endometrium to be in the proliferative phase or otherwise atypical, or showed the mucous membrane to be atrophic. In the absence of such findings the diagnosis remained unconfirmed until the case responded to treatment. Thirty-six cases of this type were treated, usually with the chorionic gonadotrophic hormone alone, because it was argued that as menstruation was normal the follicles were maturing and the dysfunction must lie in the luteinization process. Treatment was given at the beginning of the second half of the menstrual cycle. In 16 of these cases conception occurred within 6 months (at once in 7 cases and within 10 weeks in a further 7). Delivery took place at the normal time in 6 cases; abortion occurred in 2, and pregnancy is continuing in the remainder.

B. Nordin

1286. **Fertility and Salpingograms after Operation on Tubal Pregnancies.** (Fertilität und Salpingogramme nach operierten Tubargraviditäten.)

By F. LEMBERGER. *Zbl. Gynäk.*, **69**, 63–69, 1947.

Examination of statistics of 5,993 cases of tubal pregnancy showed that a second tubal pregnancy occurred in 8.96 per cent. From another set of statistics of 2,034 cases of tubal pregnancy the author found that 35.3 per cent of patients had a subsequent intrauterine pregnancy. With a view to determining the cause of the low fertility he has followed up the 196 women on whom he operated for tubal pregnancy during 1940–3. Twenty-four had recurrent tubal pregnancy. He considered 124 of the women still capable of further conception. [How this figure is arrived at is not stated.] Of the 124, 25 have since had an intrauterine pregnancy and 4 a subsequent extrauterine pregnancy. Of the remaining 95 cases 69 were investigated by uterosalpingography. In 20 no " lipiodol " passed out of the uterus; in 13 there was a blockage in the isthmus; in 14 there was a blockage at the ampulla; in 4 the Fallopian tube was clear; in 18 lipiodol passed into the peritoneal cavity. It is possible, therefore, that 18 of these 69 patients may yet become pregnant.

Gladys Dodds

1287. **Does Sterility Play a Part in the Aetiology of Fibroids?** (La stérilité joue-t-elle un rôle dans l'apparition du fibromyome utérin.)

By R. KELLER and L. GIOANNI. *Gynéc. et Obstét.*, **46**, 529–532, 1947.

Forty years ago sterility was thought to be a factor favouring the appearance of uterine fibroids, but to-day most gynaecologists do not agree with that view. The authors have reconsidered the question against the background of what they term " gravid inactivity " of the uterus. They have noted an average of at least 10 years between the detection of a fibroid and the last pregnancy. In an analysis of 249 cases they establish the fact that most fibroids have developed during the period of sexual activity—the few post-menopausal cases being usually associated with ovarian tumours showing hyperfolliculism. Their analysis indicated that of 249 women 230 still menstruated when the fibroid was discovered; in the other cases the fibroid was found shortly after the menopause and could be presumed to have existed at the time of menstruation. They analyze the degree of parity, and note that there were 76 (30 per cent) nulliparous women, and 173 (70 per cent) who had borne children. The analysis of the latter group, however, showed that 131 had at least a 10-year interval since the last pregnancy, and if to this is added those cases discovered during pregnancy with an equally long interval since the previous pregnancy, a final total is obtained of 93.6 per cent of cases. They confirm these figures by finding that 72 per cent had a 15-year interval. The authors consider this conclusive evidence that the factor concerned is the " gravid inactivity " of the uterus for at least 10 years before the discovery of the fibroid. In all these cases the predisposing factor is the fact that the uterus has not functioned in the gravid state.

As regards the argument that the fibroid may itself be the cause of the inactivity of the uterus, they note that most fibroids are found later in life, whereas the first pregnancy occurred before the age of 30; moreover, in many cases the sterility has been found to be due to the husband or to contraceptive methods. They conclude that " the fibroid is by itself a rare cause of sterility ".

B. Sandler

1288. **Artificial Insemination.** (Artificiel insemination.)

By A. WESTMAN. *Nord. Med.*, **37**, 397–399, Feb. 27, 1948.

Abnormalities of the Reproductive Organs.

1289. **The Syndrome of Congenitally Aplastic Ovaries with Sexual Infantilism, High Urinary Gonadotropins, Short Stature and other Congenital Abnormalities. Tabular Presentation of Twenty-five Previously Unpublished Cases.**

By H. LISSER, L. E. CURTIS, R. F. ESCAMILLA, and M.B. GOLDBERG. *J. clin. Endocrinol.*, **7**, 665–687, Oct. 1947. 9 figs., 9 refs.

Twenty-five cases of the syndrome of ovarian aplasia are described. Of these, 6 were investigated by laparotomy or peritoneoscopy and confirmed. The urinary excretion of gonadotrophin was examined in 15 cases; in 11 of these the excretion was over 150 mouse units, the normal for adult menstruating females being from 10 to 50 and for children 0 to 5 mouse units. In 9 cases the diagnosis was based on primary amenorrhoea in association with infantilism and short stature with stocky build. The height of the patients exceeded 145 cm. in 5 cases only. These are regarded as presumptive cases, whereas the others are considered to be confirmed either by laparotomy or by the finding of a high gonadotrophin excretion. The syndrome must be distinguished from pituitary infantilism, in which the excretion of gonadotrophin is low, and from eunuchoidism originating in childhood, in which growth is not retarded and the limbs are disproportionately long. Treatment with oestrogens was successful; there was adequate mammary development and growth of sexual hair and of the external and internal genitalia, except for the absent ovaries. Regular withdrawal menstruation was also achieved.

H. Herxheimer

1290. **Uterus Didelphys.**

By J. S. GALANG. *J. Philippine med. Ass.*, **34**, 89–91, Feb. 1948. 2 refs.

1291. **Vesicovaginal Fistula.**

By J. E. BELLAS. *Illinois med. J.*, **93**, 138–143, Mar. 1948. 3 figs., 2 refs.

1292. **Vulvar Synechia in a Child.** (Synéchie de la vulve d'enfant.)

By K. VESELY. *Ann. paediatr., Basel*, **170**, 151–161, Mar. 1948. 4 figs., 6 refs.

1293. **Social and Psychological Readjustment of a Pseudohermaphrodite Under Endocrine Therapy.**

By R. S. FINKLER. *J. clin. Endocrinol.*, **8**, 88–96, Jan. 1948. 4 figs., 8 refs.

Infections of the Reproductive Organs.

1294. **Ultraviolet Blood Irradiation Treatment of Pelvic Cellulitis. Knott Method.**

By R. C. OLNEY. *Amer. J. Surg.*, **74**, 440–443, Oct. 1947. 32 refs.

The usual methods of treatment of pelvic cellulitis and pelvic inflammatory disease aim at destroying the infecting organism, and neglect to increase the resistance of the host. The latter can be achieved by ultraviolet blood irradiation by the Knott technique, in which the blood oxygen is increased up to 300 per cent and the phagocytic action of the white cells by 50 to 100 per cent. The treatments are given at intervals of 2 to 4 weeks, and 2 to 6 treatments, sometimes more, are required. In chronic cases they are given at intervals of 1 month, 2 months, or 3 months. The author has treated 631 patients since 1944. Almost all massive inflammatory lesions will subside completely without surgical intervention. Many of the patients had massive inflammatory lesions which had persisted for years in spite of other treatment. In most of them swelling and tenderness disappeared in 4 to 8 weeks. Another interesting group consisted of 174 women, many of them single, who had tender and painful pelvic organs with dysmenorrhoea but no palpable swellings. Of these, 87 per cent were entirely relieved of all symptoms. During 25 years of practice the author has never found any treatment for chronic pelvic cellulitis that compares with this.

F. J. Browne

1295. **Pelvic Inflammatory Lesions in the Female and Diathermy.** (Inflammazione dei genitali interni femminili e diatermia.)

By T. M. CAFFARATTO. *Gazz. med. ital.*, **107**, 9–17, Jan. 1948. 2 figs.

1296. **Preliminary Report. A—Contact Testing of the Vagina with Vaginal Suppositories containing Penicillin. B—The Therapeutic use in Dermatology of Vaginal and Rectal Suppositories containing Penicillin.**

By L. GOLDMAN and M. D. FELDMAN. *J. invest. Derm.*, **9**, 155–156, Sept. 1947. 1 fig.

This preliminary study included 30 in-patients and out-patients, 19 with skin disease and 11 others. Suppositories containing 100,000 units of penicillin in a base consisting of cocoa butter, a small amount of bismuth subcarbonate, and enough beeswax for firmness were used for an average period of one week. The therapeutic effect seemed to be good in all cases except one, and it appeared that penicillin may be absorbed readily from both rectal and vaginal suppositories. Attempts were made to perform patch tests on the vaginal mucosa in 5 patients; no local reaction was seen.

E. W. Prosser Thomas

1297. **The Treatment of Vaginitis with Penicillin Vaginal Suppositories.**

By S. ABEL and C. J. FARMER. *Quart. Bull. Nthwest. Univ. med. Sch.*, **22**, 5–9, Spring Quarter 1948. 3 refs.

1298. **Vaginal and Rectal Pruritus—Etiology and Treatment.**

By E. L. CORNELL. *Amer. J. Obstet. Gynec.*, **55**, 691–698, Apr. 1948.

1299. **A Study of Cervical Cultures Taken in Cases of Acute Gonorrhea with Special Reference to the Phases of the Menstrual Cycle.**

By M. L. Koch. *Amer. J. Obstet. Gynec.*, **54**, 861–866, Nov. 1947. 2 figs. 7 refs.

The difficulty of obtaining positive cultures from patients having the clinical picture of acute gonorrhoea has for long been blamed on the cultural characters of the gonococcus. A preliminary investigation, however, showed that the percentage of positive cultures in such cases varied with the time they were taken in relation to the menstrual cycle. Fifty patients suspected of having acute gonorrhoea and with normal cycles were examined for the presence of gonococci in the cervix at different times in the cycle, and the pH of cervical mucus was determined. When the acidity was highest (pH 5.8 to 6.2), often between the twenty-second and twenty-fifth days of the cycle, all swabs were negative for gonococci. At the more favourable hydrogen ion concentrations of 6.8 to 7.5 found early in the cycle (first to eleventh day) some 81 per cent were positive, and the proportion varied between these limits.

D. M. Stern

1300. **Syphilitic Chancre of the Cervix.** (El chancro sifilítico del cuello uterino.)

By E. De Gregorio. *Med. clin.*, **10**, 158–167, Mar. 1948. 7 figs., 12 refs.

1301. **Trichomoniasis — The Seventh Venereal Disease.**

By L. F. Freed. *S. Afr. med. J.*, **22**, 223–229, Mar. 27, 1948. 55 refs.

1302. **Treatment of Trichomonas Vaginitis by Phenylmercuric Borate.** (Le traitement de la vaginite à trichomonas par le Merfen.)

By E. Witzig and J. Chatillon. *Praxis*, **37**, 227–229, Apr. 1948. 27 refs.

1303. **Urethro-vaginal Fistula and Urogenital Atresia due to Lymphogranuloma Venereum.** (Fistula uretro-vaginal y atresia urogenital linfogranulomatosas.)

By S. Fuenzalida and R. Vargas Zalazar. *Bol. Soc. chil. Obstet. Ginec.*, **12**, 186–188, Aug. 1947. 2 figs., 6 refs.

1304. **Combined Fever- and Sulphathiazole-Treatment of Salpingitis.** (Kombineret feber- og sulfatiazolbehandlung af salpingitis.)

By N. Blixenkrone-Møller and P. Schou. *Nord. Med.*, **37**, 408–409, Feb. 27, 1948. 5 refs.

1305. **Ovarian Abscess.** (Het ovariumabsces.)

By T. J. Van Sante. *Ned. Tijdschr. Geneesk.*, **92**, 1227–1234, Apr. 24, 1948.

1306. **The Clinical Significance of Chronic Parametritis.**

By C. F. Fluhmann. *California Med.*, **68**, 159–161, Mar. 1948. 7 refs.

1307. **Psychic Disturbances in Inflammations of the Adnexa.** (Les troubles psychiques au cours des annexites.)

By A. Laffont, M. Bonafos, and R. Garès. *Gynéc. et Obstét.*, **46**, 666–676, 1947. 18 refs.

1308. **Bacteriological and Histological Diagnosis of Adnexal Tuberculosis.** (Zur bakteriologischen und histologischen Diagnose der Adnextuberkulose.)

By E. Held. *Gynaecologia, Basel*, **125**, 56–60, Jan.-Feb. 1948.

1309. **Tuberculosis of the Cervix.** (Tuberculosis del cuello de utero.)

By N. Arenas, O. Blanchard, and J. C. Lazcano Gonzalez. *Rev. Ginec. Obstet.*, **1**, 128–141, Feb. 1948. 6 figs., 48 refs.

New Growths of the Reproductive Organs.

1310. **Pelvic Cancer Delay.**

By J. Y. Howson. *Amer. J. Obstet. Gynec.*, **55**, 538–540, Mar. 1948.

1311. **Multiple Pelvic Malignancies.**

By W. H. Hill and W. R. Glenn. *Sth. Surg.*, **14**, 192–194, Mar. 1948. 3 refs.

1312. **Relief of Pain in Intractable Cancer of the Pelvis.**

By M. Kenny. *Brit. med. J.*, **2**, 862–863, Nov. 29, 1947.

Caudal injection of " proctocaine " has been used for the relief of pain in 18 cases of intractable cancer of the pelvic organs (uterus, bladder, prostate, and vagina) at the British Post-Graduate Medical School. The procedure is simple, can be carried out by those without special surgical skill, and may be repeated if required.

The patient is placed in the left lateral position, and the skin over the sacral hiatus is infiltrated with 5 ml. of 1.5 per cent procaine. A 3-in. (7.5 cm.) record needle (bore 2) is inserted, and after penetrating the fibrous membrane is pushed into the sacral canal for a further inch (2.5 cm.). No blood or cerebrospinal fluid should be obtained. After a preliminary injection of 5 ml. of 1.5 per cent procaine to ensure that the injection is being made within the sacral canal, 40 to 60 ml. of warm proctocaine is injected slowly, until pain is relieved or until the level of skin anaesthesia reaches the line of the nipple. Ten minutes are usually required for the injection. If pain is not immediately relieved it may disappear only when the patient lies on the right side, or stands up, or lies on his back with the foot of the bed raised. The injection may be repeated in a few weeks if the pain returns.

In the series results were satisfactory in 13 cases, pain being relieved by 1 to 3 injections for a period of 3 weeks to 4 months. In 1 case 5 ml. of absolute alcohol was added to the proctocaine at the second injection. In 4 cases results were unsatisfactory, because painful metastases developed elsewhere.

There were no cases of urinary or faecal incontinence, unfortunate sequelae sometimes noted after intrathecal injection of alcohol. One patient died shortly after caudal injection had been started, under thiopentone anaesthesia necessitated by the severity of the pain. Permission for necropsy was refused, and oil embolism could not therefore be excluded as a cause of death. *Ian T. Fraser*

1313. **Aspiration Curettage of the Endometrium in a Cancer Clinic. An Analysis of 200 Cases.**

By G. A. WILLIAMS and C. B. STEWART. *Amer. J. Obstet. Gynec.*, **54**, 804–808, Nov. 1947. 4 refs.

In a busy cancer clinic many women are investigated for vaginal bleeding or discharge in whom no abnormality is found. Careful and repeated investigation is required in these patients, who do not always consent to operative measures under anaesthesia. The authors believe that there is a definite place in these cases for aspiration curettage of the endometrium. A size 12 metal male catheter is used, carrying on the convex surface of its shortened beak a knife-edged fenestrum. The uterine cavity is explored for irregularities of the surface and then the fenestrum is applied firmly to one border. When suction is applied the beak of the catheter methodically explores the entire surface. A volsellum is used to steady the cervix if it is unduly mobile. Curettings are ejected into normal saline solution. The result of the investigation of 200 cases is well summarized in the following tables.

Initial Pathologic Diagnoses in Aspiration Curettings

Initial Diagnosis	Pre-Menopausal	Post-Menopausal	Total
Number of Patients	142	58	200
Insufficient tissue	15	9	24
Proliferative	21	3	24
Mixed proliferative and secretory	1	—	1
Secretory	22	—	22
Hyperplastic	61	8	69
Atrophic	—	13	13
Chronic endometritis, undetermined	3	2	5
Chronic endometritis, fibromyoma	5	2	7
Chronic endometritis, polyps	2	2	4
Chronic endometritis, puerperal	7	—	7
Cervical polyp, precancerous	1	1	2
Adenocarcinoma of endometrium	2	16	18
Adenocanthoma of endometrium	—	1	1
Epidermoid carcinoma of cervix	1	1	2
Adenocarcinoma of cervix	1	—	1

Final Diagnoses in Group with "Unsatisfactory" Aspiration Curettage Diagnoses

Final Diagnosis	Before Menopause	After Menopause		
	Insufficient Tissue	Insufficient Tissue	Atrophic	Chronic Endometritis
Atrophic vaginitis	—	2	3	—
Carcinoma of cervix	1	1	—	—
Carcinoma of endometrium	—	1	—	—
Cervical polyp	—	—	3	—
Oestrogen withdrawal	—	1	—	—
Fibromyomata uteri	5	1	4	—
Fibrosis uteri	1	—	—	—
Hyperplasia of endometrium	2	—	—	—
Arterial hypertension	—	1	3	—
Stricture of cervix, benign	—	—	—	1
Diagnosis not determined	6	3	—	1

Aspiration Diagnoses Checked by "Surgical" Diagnoses

Surgical diagnosis in full agreement	26
Surgical diagnosis in partial agreement ...	2
Surgical diagnosis in positive agreement ...	2
Surgical diagnosis in negative disagreement	5
Total cases checked without preoperative radiation	35

G. Gordon Lennon

1314. **The Endocrine Factors in Pelvic Tumors, with a Discussion of the Papanicolaou Smear Method for Diagnosis.**

By A. E. RAKOFF. *Radiology*, **50**, 190–201, Feb. 1948. 9 figs., 20 refs.

1315. **The Importance of Diagnostic Aspiration through the Vaginal Vault.** (A huvelyboltozati szurcsapolas jelentősége.)

By M. ACS. *Orvosok Lapja*, **4**, 141–145, Feb. 1, 1948. 8 refs.

1316. **Further Observations with Intravaginal Roentgen Therapy of Cancer of the Female Pelvis.**

By W. W. WASSON and R. GREENING. *Radiology*, **49**, 452–461, Oct. 1947. 10 figs., 3 refs.

This paper emphasizes that Stage 1 cancer of the cervix can be cured by either surgery or the various forms of irradiation, while failure occurs in the second, third, and fourth stages. The method of irradiation is described, and certain procedures are suggested which hold out hope of better results. The anatomical structures involved in cancer of the cervix lie within the birth canal. Examination to determine the exact tissues involved by growth should be carefully carried out, a point often over-

looked because the disease is so frank and apparent. Type, grade, and extent must be determined. External irradiation should be standard in all except Stage 1 tumours, a dose of 2,500 r being delivered to the tumour area in a few weeks. As the contour is not uniform a perineal field should be used in order to raise the dose to the lateral lymph nodes. As at least 4,000 r must be delivered to destroy cancer, the extra 1,500 r is delivered through intravaginal cones. If the sum of the diameters of the areas treated equals that of the birth canal then radium must be used inside the uterus to complement the X-ray therapy. It should always be employed in Stages 2, 3, and 4. By these means a tumour dose of 5,000 r can be delivered in the birth canal, but this can never be repeated. The authors point out that intravaginal X-ray therapy can be used after operations on the uterus and ovaries, or on caecum, bladder, and rectum. *I. G. Williams*

1317. **Some Little-known Applications of X-ray Therapy in Gynaecology.** (Su alcune applicazioni meno note della roentgenterapia ginecologica.)

By E. Robecchi. *Gazz. med. ital.*, **107**, 17–20, Jan. 1948.

1318. **Behaviour of the Erythrocyte Sedimentation Rate in Cases of Malignant Tumours of the Female Genital System Treated by Radium and X-ray Therapy.** (Comportamento della velocità di sedimentazione in donne affette da tumori maligni dell'apparato genitale sottoposte a radium- e roentgen-terapia.)

By T. Tavano. *Gazz. med. ital.*, **107**, 21, Jan. 1948.

1319. **The Treatment of Cancer of the Female Genitals by Irradiation.** (Léčba rakoviny zenskych rodidel zárenim.)

By K. Havranek. *Lék. Listy*, **3**, 212–217, Apr 15, 1948. 20 refs.

1320. **The Treatment of Carcinoma of the Vulva.**

By J. L. McKelvey. *Amer. J. Obstet. Gynec.*, **54**, 626–635, Oct. 1947. 7 refs.

The author adopted radical vulvectomy as a standard treatment for carcinoma of the vulva and compares the results obtained before and after this decision.

Two groups of cases are recorded—32 treated by various means before 1938 and 38 by radical vulvectomy since 1938. In the first group operation resulted in a primary mortality of 6 per cent, and only 5 were alive without recurrence, an absolute cure rate of 13.9 per cent. In the later group there were 4 deaths—a primary mortality rate of 10 per cent. Four patients are alive and free from recurrence after 5 years and 18 are alive without recurrence for periods varying from 2 to 59 months. It is therefore too early to assess the ultimate 5-year cure rate, but the improvement is undoubtedly significant. The author claims an operability rate of 90 per cent, and carries out a wide excision under local analgesia; simultaneous dissection of the inguinal lymph nodes and fat are performed by the operator and his assistant, and wide excision is essential. Skin defects are allowed to granulate, and later are covered with pinch grafts. Breaking down of the wound is frequent, and cannot be avoided by any known procedure. The author believes that X-ray therapy is of little value in effecting a cure and is useless as a palliative measure, and he rightly opposes removal of inguinal lymph nodes for biopsy as these lymph nodes must be removed later in any case. He recommends getting these patients up as early as possible after operation, particularly the elderly. *E. D. Grasby*

1321. **Bartholin Cyst. A Simple Method for its Restoration to Function.**

By J. W. Davies. *Surg. Gynec. Obstet*, **86**, 329–331, Mar. 1948. 2 figs., 2 refs.

1322. **Primary Carcinoma of Bartholin's Gland.**

By R. J. Crossen. *Amer. J. Surg.*, **75**, 597–600, Apr. 1948. 2 figs., 6 refs.

1323. **Mesodermal Mixed Tumor of the Vagina: Report of Case.**

By G. H. Murphy and J. W. DuShane. *Amer. J. Obstet. Gynec.*, **55**, 527–532, Mar. 1948. 4 figs., 18 refs.

1324. **Rare Forms of Uterine Tumour.** (Zur Kasuistik seltener Geschwulstformen des Uterus.)

By J. Gosch. *Z. Geburtsh. Gynäk.*, **129**, 103–106, 1948. 2 figs., 7 refs.

1325. **The Etiology of Fibromyomata of the Uterus. Part I: A Review of the Literature and Preliminary Comments on the Hartman-Littrell Technique of Assay.**

By J. P. Martin. *J. nat. med. Ass.*, **40**, 49–58, Mar. 1948. Bibliography

1326. **The Autonomic Nervous System in Patients with Uterine Fibroids.** (L'orientamento neurovegetativo della portatrice di fibroma uterino.)

By V. Girardi and V. Rindi. *Mon. ostet.-ginec.*, **18**, 306–328, July-Dec. 1947. 28 refs.

1327. **Lymphoangiocystofibroma of the Uterus.** (Das Lymphangiocystofibroma uteri.)

By H. B. Lang. *Wien. med. Wschr.*, **98**, 117–119, Mar. 20, 1948. 17 refs.

1328. **Treatment of Fibroids by Radium.** (Tratamiento de los fibromas uterinos por el radio.)

By M. T. F. De Gaudino. *An. Med. Cirug.*, **23**, 23–28, Jan. 1948.

1329. **Treatment of Uterine Fibroids.** (Tratamento dos fibromas uterinos.)

By P. Brocq. *Rev. brasil. Cir.*, **16**, 27–40, Dec. 1947.

1330. **Treatment of Uterine Fibroids.** (Traitement des fibromes utérins.)

By P. Brocq. *Gynécologie*, **44**, 221–246, Sept.-Oct. 1947.

1331. **Carcinoma and Uterine Fibromyomas.**
By F. H. FALLS. *J. int. Coll. Surg.*, **11**, 24–28, Jan.-Feb. 1948.

1332. **The Early Diagnosis of Uterine Malignancy.**
By T. L. LEE and H. F. FULLER. *N. Carolina med. J.*, **9**, 9–11, Jan. 1948. 4 refs.

1333. **The Use of Vaginal Smears in the Diagnosis of Genital Cancer.**
By J. R. KERNODLE, W. K. CUYLER, and W. L. THOMAS. *N. Carolina med. J.*, **9**, 11–17, Jan. 1948. 3 figs., 15 refs.

1334. **Clinical Features of Sarcoma of the Uterus.** (Zur Klinik des Uterussarkoms.)
By K. RICHTER. *Krebsarzt*, **3**, 91–101, Mar. 1948. 7 refs.

1335. **Simultaneous Carcinomata of Uterus and Ovary.** (Les cancers simultanés de l'utérus et de l'ovaire.)
By P. FUNCK-BRENTANO and H. ROBERT. *Gynéc. et Obstét.*, **47**, 5–26, 1948. 2 figs. Bibliography.

1336. **Results of Treatment of Carcinoma of the Body of the Uterus.**
By E. T. BRADLEY. *Connecticut med. J.*, **12**, 112–113, Feb. 1948.

1337. **Radiotherapy of Uterine Carcinoma in Three North American Institutions.** (Radioterapia del cancro uterino in tre Istituti Nord-Americani.)
By G. VALLE. *Gazz. med. ital.*, **107**, 22–28, Jan. 1948.

1338. **Carcinoma of the Cervix in an Urban Population.**
By A. W. DIDDLE and T. R. BENNETT. *Amer. J. Obstet Gynec.*, **55**, 669–675, Apr. 1948. 18 refs.

1339. **Carcinoma of the Cervix Complicating Procidentia Uteri.**
By D. L. ASHTON. *Amer. J. Obstet. Gynec.*, **55**, 299–302, Feb. 1948. 12 refs.

1340. **Anaplastic Cervical Epithelium. Relationship to Cervical Carcinoma.**
By C. T. ASHWORTH and A. W. DIDDLE. *Sth med. J.*, **41**, 217–221, Mar. 1948. 3 figs., 11 refs.

1341. **Impressions of the Vaginal Smear Technic in the Diagnosis of Cervical Cancer.**
By L. C. POSEY and J. A. CUNNINGHAM. *Sth med. J.*, **41**, 221–228, Mar. 1948. 5 figs., 10 refs.

1342. **Diagnosis and Treatment of Carcinoma of the Cervix.** (Diagnostico y conducta terapéutica en el cáncer del cuello uterino.)
By J. M. BEDOYA. *Med. colon.*, **11**, 119–132, Mar. 1, 1948.

1343. **Five-year End-results in the Treatment of Carcinoma of the Uterine Cervix.**
By E. L. JENKINSON, E. L. PIRKEY, and F. J. HAMERNIK. *Radiology*, **49**, 415–418, Oct. 1947.

The 5-year results in 95 unselected cases of carcinoma of the uterine cervix treated from 1934 to 1941 inclusive are analyzed; of these only 75 were actually followed up; 55 patients are known to be dead and 18 alive. In Stages 1 and 2, 77 and 87.5 per cent respectively survived for 5 years free from disease, while in Stages 3 and 4 the figures were 26.6 and 3.5 per cent. Analysis of a small number of cases treated with different filtrations and voltages shows much better results with the heavier filtration. Three out of 5 patients who received contact therapy were alive and well 5 years later. [Even in this small series the high percentage of survivals in Stages 1 and 2 and the low percentage in Stages 3 and 4 are striking. The authors ask why more patients are not seen in the early stages. The fault may be with the patient because of lack of education, or with the medical profession.] *I. G. Williams*

1344. **The Significance of Fractional X-ray Therapy (Prolonged Irradiation) in the Treatment of Advanced Carcinoma of the Cervix.** (Die Bedeutung der fraktionierten Röntgentherapie (Langzeitbestrahlung) in der Bekämpfung des progressen Carcinoma colli uteri.)
By R. SHRŒDER and H. KIRCHHOFF. *Zbl. Gynäk.*, **69**, 114–125, 1947. 4 figs., 6 refs.

The treatment and late results are reported in 501 cases of carcinoma of the cervix; 186 (36.9 per cent) patients were well with no evidence of carcinoma 5 years later.

The clinical classification was:— Group I: well-localized carcinoma, 21 cases; Group II: carcinoma more extensive but still localized to the cervix; parametrium not involved, 260 cases; Group III: infiltration of parametrium around the cervix, 130 cases; Group IV: infiltration of parametrium as far out as the wall of the pelvis, 58 cases; Group V: (*a*) isolated metastases, or bladder and/or rectal fistula, 26 cases; (*b*) patients who refused treatment, 6 cases.

Of the patients in Groups I and II, 149 had either a Wertheim or a Schauta operation. The immediate mortality was 18 (12.1 per cent); 86 (57.7 per cent) were alive and free from carcinoma 5 years later. In Groups I and II 132 patients were treated by radium—7 also had a course of deep X-ray therapy. The immediate mortality was 7 (5.3 per cent). The 5-year cure rate was 44 per cent. Of the Group III patients 15 had either a Wertheim or a Schauta operation. The immediate mortality rate was 13.3 per cent and the 5-year cure rate 20 per cent. In Group III, 115 patients were treated by radium—22 also had deep X-ray therapy. The immediate mortality rate was 5.2 per cent and the 5-year cure rate 24.3 per cent.

The most interesting part of this report concerns the 58 patients in Group IV, 54 of whom were treated by X-ray therapy only—2 died within 2 months after the first treatment, 1 from uraemia and 1 from haemorrhage; 29 showed no improvement from treatment; 7 improved but carcinoma was present after 1 year; and 2 died of intercurrent

diseases with no sign of carcinoma. One patient was free from recurrence for 5 years, but lymph-node metastases then developed; 13 patients were free from recurrence for 5 years or longer. Thus 16 out of 54 patients in Group IV were free from recurrence for 5 years or longer. Histological examination of the carcinoma was carried out in every case.

Kirchoff discusses X-ray treatment and refers to the successful results obtained by Coutard in the treatment of carcinoma of the larynx by fractional doses and prolonged treatment. Prolonged treatment with small doses is not suitable in cases of advanced carcinoma of the cervix, as the patients are usually debilitated and cachectic. Kirchoff, by irradiation of dogs' testes showed that there was no need for prolonged intervals between doses. He also increased the dose from 200–250 r to 380–400 r as the tumour in the pelvis was at a greater depth from the surface than a laryngeal tumour. A further point of difference from the Coutard method was that a crossfire method was used instead of homogeneous treatment of greater fields.

Fields irradiated were the abdomen, right and left; back, right and left; vulva; sides, right and left. Size of field was 10×15 cm., skin-focus distance 40 cm.; a filter of 1 mm. copper was used with a current of 180 kV and 4 mA. Each skin field received 400 r, two fields being irradiated daily. The vulva was given 3 or 4 treatments (1,200 or 1,600 r), and all the other fields received 8 to 10 (3,200 to 4,000 r).

Fifteen patients complained of headache, nausea, and marked exhaustion during treatment; 22 had severe and 12 slight intestinal symptoms. Pyrexia occurred during the treatment in 23 cases; in 6 it was marked. Oedema of the skin and exfoliative dermatitis were rare. The best results were obtained in cases treated by the Coutard method only. Cases previously treated by radium did not respond so well. Where the disease extended to the wall of the pelvis the results of treatment were not very good. *Gladys Dodds*

1345. **Transvaginal Roentgen Therapy in Carcinoma of the Cervix.**

By J. A. DEL REGATO. *Radiology*, **49**, 413–414, Oct. 1947. 3 figs.

Whatever the means of internal irradiation treatment in carcinoma of the cervix, it constitutes only a complement to external irradiation, and results will depend upon the adequacy of external irradiation, which should precede the internal phase of treatment. The author uses a transparent-walled vaginal speculum to allow the field to open to about 6 cm. at the level of the cervix and so irradiate cervix, fornices, and adjacent parametria. With the patient in the lithotomy position the widest possible speculum is used. Physical factors are 140 kV, 0.5 mm. Cu filter, 25 cm. skin-focus distance, 3,000 to 4,000 r (air) being delivered in 14 days. Advantages are that it completes the external irradiation without trauma and assures a more homogeneous irradiation, that patients need not be admitted to hospital, and that it can be sufficiently protracted to reduce to a minimum the untoward effects of irradiation. Of 52 unselected patients 22 are alive and well at the end of 3 years. *I. G. Williams*

1346. **Intracavitary Radium Therapy for Carcinoma of the Uterine Cervix.**

By H. H. BOWLING. *Radiology*, **49**, 406–410, Oct. 1947. 3 refs.

For 30 years radiologists at the Mayo Clinic have used a constant method of intracavitary radium therapy for carcinoma of the cervix uteri. A standard 50-mg. radium applicator is used and inserted at intervals spread over 21 days. The treatment area is divided into zones, the dose in each zone being: vaginal, 2,100 mg.-hours; proximal cervical, 1,400 mg.-hours; distal cervical, 1,400 mg.-hours; intrauterine, 2,000 to 2,400 mg.-hours. All applications are made with the patient in the knee-chest position, because this allows easier visual examination and palpation, selection of the site of biopsy, and more accurate placing of the radium. Supplementary external X-ray therapy is given to the parametria through two anterior and two posterior fields.

Years	Patients Treated	Patients Followed-up	Alive 3 Years and Over
1915–19	288	264	38 (14.4%)
1920–24	556	522	185 (35.4%)
1925–29	647	585	250 (42.7%)

When classified in stages the results in 1,079 patients where the disease had not been modified by previous treatment were:

Stage	Patients Treated	Patients Followed-up	Patients Alive
1	13	13	9 (69.2%)
2	85	78	47 (60.2%)
3	825	753	224 (29.7%)
4	156	138	9 (6.5%)

Of 565 patients who received a complete course of treatment 52.9 per cent lived 3 years or more, while of 739 patients who received a limited course only 21.4 per cent lived for 3 years or more. Morbidity figures are not available, but the author was not impressed by the number and severity of reactions. *I. G. Williams*

1347. **Interstitial Radium Therapy in Carcinoma of the Cervix.**

By G. W. WATERMAN. *Radiology*, **49**, 411–412, Oct. 1947. 1 ref.

At the Rhode Island Hospital interstitial radium therapy has been used in the treatment of carcinoma of the cervix since 1926. Long needles

of 0.66 mg. per cm. intensity and 2 to 3 mm. platinum wall are used. They are inserted into the advancing zone of growth, and a platinum capsule of 20 mg. is inserted into the cervico-uterine canal, the whole being left *in situ* for 7 days. Advantages claimed for this method are: (1) Slow continuous irradiation for a long time. (2) Extreme adaptability to all types of cervical cancer. (3) The radiation is delivered in and around the growth and not on the vaginal walls. Complications such as fistula, necrosis, and sepsis have been no more frequent than with other forms of therapy. Sulphonamides, penicillin, and preliminary X-ray irradiation have decreased the incidence and danger in infection. The absolute 5-year survival rate in 198 cases was 38.9 per cent; for 171 cases treated with radium alone the figure was 44.4 per cent (relative). *I. G. Williams*

1348. **Results and Causes of Failure of Radiation Therapy in Carcinoma of the Cervix.**
By H. S. KAPLAN, H. M. WILSON, and A. H. MORSE. *Surg. Gynec. Obstet.*, **86**, 332–340, Mar. 1948. 25 refs.

1349. **Technique of Radium Therapy in Carcinoma of the Cervix Uteri.** (Sur la technique de la Curiethérapie des cancers du col de l'utérus.)
By E. WALLON. *Presse méd.*, **56**, 244–245, Mar. 31, 1948.

1350. **Radiation Therapy of Carcinoma of the Cervix.**
By J. P. CONNOLLY. *Connecticut med. J.*, **12**, 114–115, Feb. 1948.

1351. **X-ray Therapy of Carcinoma of the Cervix.** (Die Strahlenbehandlung des Kollumkarzinoms.)
By P. HESS and A. PROPPE. *Strahlentherapie*, **77**, 199-210, 1948. 3 figs., 28 refs.

1352. **Radiation and Surgical Trends in the Treatment of Cancer of the Cervix Uteri.**
By A. N. ARNESON. *Amer. J. Roentgenol.*, **59**, 251–259, Feb. 1948. 16 refs.

1353. **Late Recurrence of Cervical Carcinoma Following Radiation Therapy.**
By H. SPEERT. *Amer. J. Obstet. Gynec.*, **55**, 533–537, Mar. 1948. 3 figs., 5 refs.

1354. **Results of Treatment in Adenocarcinoma of the Cervix Uteri.** (Behandlungsergebnisse beim Adenokarzinom des Collum uteri.)
By B. SCHINK. *Zbl. Gynäk.*, **69**, 338–349, 1947. 16 refs.

Out of 1945 cases of carcinoma of the cervix treated in the Universitäts Frauenklinik in Jena from 1927 to 1941, 34 were of adenocarcinomata—8 were operable, 5 borderline cases, and 21 inoperable. Only 3 patients were operated upon, the rest being treated with radium followed by deep X-ray therapy. A total of 5,000 to 6,000 mg.-hours was given in two stages, the radium being at first inserted into the cervical canal, but later into the uterine cavity. From 1940 onwards mesothorium was in use. Seven patients lived for over 5 years. The cure rate in operable cases was 31.7 per cent and in inoperable cases, 14.3 per cent; the primary mortality rate was 3.5 per cent. From these results the following conclusions are drawn. Adenocarcinoma of the cervix can be cured by radio-therapy, the dosage being the same as for squamous carcinoma. Since adenocarcinomata infiltrate the parametria and reach the pelvic wall earlier than do squamous-cell carcinoma, early diagnosis is more important. The recurrent adenocarcinoma does not respond to irradation.
L. Ganz

1355. **Syphiloma of the Neck of the Uterus.** (Sul sífiloma del collo dell'utero.)
By A. V. FERRARI. *Dermosifilografo*, **122**, 207–226, Sept.-Oct. 1947. 29 refs.

Syphiloma of the cervix, though mentioned in all textbooks, is still considered to be very rare and is often not detected. It is mostly situated on the anterior lip of the cervix. In diagnosis of this syphiloma, as in almost all syphilomata, the finding of enlarged lymph nodes is important; because they accompany every syphilitic infection. The author points out the need for clinical and laboratory examinations for syphilis whenever there are erosions or ulcerations of the cervical mucosa. He describes 6 cases personally observed, some of which demonstrate how easily this lesion may escape observation, even by skilled clinicians. It is concluded that: (1) syphiloma of the cervix is not so rare as it has been thought to be; this fact is demonstrable if systematic investigations are carried out in cases of recent secondary syphilis; (2) diagnosis is not easy, since syphiloma of the cervix does not always cause subjective symptoms and may be confounded with other lesions; (3) a search for enlarged pelvic lymph nodes, the usual lymphatic reaction in this particular type of syphilitic lesion, may help diagnosis.
Kate Winkler

1356. **Pain in Uterine Malformations. The Role of Endometriosis and its Bearing on Therapy.** (Les douleurs dans les malformations utérines: le rôle de l'endométriose et ses conséquences thérapeutiques.)
By J. MATHIEU. *Gynéc. et Obstét.*, **47**, 159–163, 1948.

1357. **Endometriosis at Sites Distant from the Uterus.** (Endometriose à distância do útero.)
By C. C. DA COSTA. *An. brasil. Ginec.*, **25**, 7–16, Jan. 1948. 6 figs.

1358. **The Surgical Aspects of Endometriosis.**
By V S. COUNSELLER. *J. int. Coll. Surg.*, **11**, 29–33, Jan.-Feb. 1948. 4 refs.

1359. **Uterine Endometriosis.** (L'endometriosi uterina interna.)
By A. PAVONI. *Mon. ostet.-ginec.*, **18**, 238–266, July-Dec. 1947. 32 refs.

1360. **Recurrence of Bilateral Ovarian Endometriosis after Castration. Favourable Effect of Testosterone.** (Récidive d'une endométriose ovarienne bilatérale après castration. Action favorable de la testostérone.)

By E. DELANNOY. *Gynéc. et Obstét.*, **46**, 533–536, 1947. 1 ref.

The author describes a case of endometriosis, in a woman of 42, treated by bilateral removal of the ovaries. Within 3 months exactly the same symptoms developed, pain, a mass in the abdomen, and vaginal bleeding, which the author considers to be due to recurrence of the endometriosis. He quotes numerous writers who suggest that such symptoms may be due to a residual cyst of the ovary, but he thinks it more likely that small fragments of the endometrioma were left behind. He reviews briefly the various suggested treatments and notes his success with small doses of testosterone (520 mg. a month to begin with and a maintenance dose of 100 mg. monthly). With these small dosages he has not observed the masculinizing reactions noted by other authors.

[This article suggests a useful method of treatment of the endometriomata, which often present an apparently insoluble problem when they recur after operation. These experiences with testosterone call for a wider investigation in Britain. It is a pity that the very full list of authors mentioned in the article is accompanied by only one reference.] *B. Sandler*

1361. **X-Ray Treatment of Ovarian Carcinoma.** (Zur Strahlentherapie der Ovarialcarcinome.)

By J. H. MUELLER. *Gynaecologia, Basel*, **125**, 67–73, Jan.-Feb. 1948. 6 refs.

1362. **Functional Tumours of the Ovary.** (Tumori ovarici a funzionalità sessuale.)

By A. BOMPIANI. *Riv. ital. Ginec.*, **30**, 364–396, 1947. Bibliography.

1363. **Is the Brenner Tumour always a Benign Neoplasm?** (Ist der Brenner-tumor immer eine gutartige Neubildung?)

By V. DUBRAUSZKY and W. v. MASSENBACH. *Zbl. Gynäk*, **69**, 370–381, 1947. 20 figs., 51 refs.

A woman 70 years of age complained of repeated slight vaginal haemorrhage of 2 years' duration and also of swelling of her abdomen. At laparotomy 3 litres of ascitic fluid were withdrawn and a left ovarian tumour was removed. The enlarged uterus was curetted. The tumour was partly solid, partly cystic; on the cut surface there was an area of medullary consistency. Histologically it consisted of epithelial nests embedded in a fibrous stroma. Some of the cysts were lined with many layers of an indifferent epithelium, whereas in others the innermost layer consisted of cylindrical epithelium staining with mucicarmine. The medullary part of the tumour, which showed definite signs of malignancy, consisted of heaped-up atypical epithelial cells separated by fine fibrous septa; some areas showed giant-cell formation. The malignant tissue formed the wall of some cysts, and the transition of the benign epithelium into the malignant could easily be followed. This would appear to be the first case of a definitely malignant Brenner tumour.

The authors believe that the Brenner tumour originates from the coelomic epithelium, and that some of the solid carcinomata and cystic adenocarcinomata of the ovary may originate in a Brenner tumour. The Brenner tumour does not produce any oestrogenic hormone; the bleeding in this case was caused by a polypoid hyperplasia of the endometrium. *L. Ganz*

1364. **A Pseudomucinous Cyst of the Ovary with Ascites and Hydrothorax.**

By S. S. ROSENFELD. *New York St. J. Med.*, **48**, 527–528, Mar. 1, 1948. 2 refs.

1365. **Dermoid Cysts of the Ovary: Suppuration and External Fistula Formation.** (Contributo allo studio delle cisti dermoidi ovariche suppurate e fistolizzate alla parete.)

By G. D'ERRICO. *G. ital. Chir.*, **4**, 99–107, Feb. 1948. 4 figs., 12 refs.

1366. **The Meigs Syndrome.** (Le syndrome de Meigs.)

By P. FUNCK-BRENTANO. *Gynéc. et Obstét.*, **47**, 150–158, 1948. 31 refs.

1367. **Theca-cell Tumour of the Ovary.** (Une observation de tumeur thécale d'un ovaire.)

By P. GUENIN and R. MESSIMY. *Mém. Acad. Chir., Paris*, **74**, 186–190, Feb. 25 - Mar. 3, 1948. 5 figs.

1368. **Tumours of the Theca Interna of the Ovary: Three Cases, One Associated with Adenocarcinoma of the Uterine Body.** (Les tumeurs de la thèque interne de l'ovaire rapport de trois cas, dont un accompagne d'un adéno-carcinome du corps de l'uterus.)

By C. BERDJIS CHAMSI. *Gynéc. et Obstét.*, **46**, 655–665, 1947. 4 figs., 36 refs.

1369. **Krukenberg Tumours.** (Considérations sur les tumeurs ovariennes " Type Krukenberg ".)

By P. SARBU, V. VASILIU, and E. MESTES. *Gynéc et Obstét.*, **47**, 178–184, 1948. 3 figs., 38 refs.

1370. **A Clinical Review of Papillary Adenocarcinoma of the Ovary.**

By G. SPECK. *Virginia med. Mon.*, **75**, 185–190, Apr. 1948. 18 refs.

1371. **Struma Ovarii.**

By G. E. NORWOOD. *Ann. west. Med. Surg.*, **2**, 19–21, Jan. 1948. 14 refs.

Operations.

1372. **Gynecologic Surgery in the Elderly Woman.**

By A. F. LASH. *Geriatrics*, **3**, 67–71, Mar.-Apr., 1948. 6 refs.

1373. **Some Urological Problems in Gynaecological Surgery.**
By E. WILLIAMS, C. LEWIS, R. O. WARD, C. G. TURNER, C. S. RUSSELL, J. C. MOIR, and V. B. GREEN-ARMYTAGE. *Proc. R. Soc. Med.*, **41**, 143-150, Mar. 1948. 1 ref.

1374. **The Use of Gelatin Sponges in Gynecologic Surgery.**
By J. W. HUFFMAN. *Quart. Bull. Nthwest. Univ. med. Sch.*, **22**, 53-55, Spring Quarter 1948. 5 refs.

1375. **Uterine Bleeding with View Toward Conservative Pelvic Surgery.**
By A. VESPER. *Kentucky med. J.*, **46**, 38-44, Feb. 1948.

1376. **Use of Vesical Peritoneum to Cover Raw Areas after Pelvic Operations. Its Obstetric Consequences.** (La péritonisation du petit bassin avec le péritoine vésical. Ses conséquences obstétricales.)
By G. COTTE and J. MATHIEU. *Rev. franç. Gynéc.*, **43**, 12-20, Jan. 1948.

1377. **Dicumarol Prophylaxis Against Venous Thrombosis in Women Undergoing Surgery.**
By G. VAN S. SMITH. *Surg. Gynec. Obstet.*, **86**, 461-464, Apr. 1948.

1378. **Prophylaxis of Post-operative Thrombosis in Gynaecology.** (Profilaxis de la trombosis post-operatoria en ginecología.)
By M. PENSADO. *Toko-ginec. pract.*, **7**, 41-58, Feb. 1948. 34 refs.

1379. **Congenital Absence of Vagina. Repair by the Kirschner-Wagner Method with Free Skin Graft.** (Ausenica congénita de vagina. Método de Kirschner-Wagner. Injerto libre de piel.)
By A. J. PAVLOVSKY and A. OGHI. *Prensa méd. argent.*, **35**, 396-401, Mar. 5, 1948. 7 figs., 2 refs.

1380. **Creation of an Artificial Vagina by Schubert's Method.** (Création d'un neo-vagin par la méthode de Schubert.)
By G. COTTE and P. SANTY. *Mém. Acad. Chir., Paris*, **74**, 54-57, Jan. 1948. 1 ref.

1381. **Treatment of Vaginal Aplasia.** (Sobre el tratamiento de la aplasia vaginal.)
By C. P. ALVAREZ. *Rev. esp. Obstet. Ginec.*, **7**, 33-44, Jan.-Feb. 1948. 2 figs., Bibliography.

1382. **Aplasia Vaginae. Two Cases Treated by Frank's Method.** (Aplasia vaginae.)
By S. SJOSTEDT. *Nord. Med.*, **37**, 405-407, Feb. 27, 1948. 2 figs., 46 refs.

1383. **Culdoscopy.** (L'endoscopia pelvica per via vaginale (culdoscopia).)
By M. TORTORA. *Arch. Ostet. Ginec.*, **53**, 25-30, Jan.-Feb. 1948. 2 figs., 13 refs.

1384. **Skiodan Acacia in Hysterosalpingography.**
By M. MASS. *J. med. Ass. Georgia*, **37**, 84-85, Mar. 1948.

1385. **Accidental Intravascular Injection of "Lipiodol" during Hysterosalpingography.** (Injections vasculaires accidentelles de lipiodol survenant au cours de l'hystérosalpingographie.)
By R. KELLER. *Gynéc. et Obstét.*, **47**, 27-41, 1948. 2 figs., 23 refs.

1386. **Tubal Insufflation and Hysterosalpingography.** (Persufflazione transtubarica e isterosalpingografia.)
By R. POGOLOTTI. *Arch. Sci. med.*, **73**, 157-198, Apr. 1948.

1387. **Obstetric Sequelae of Ligamentopexy by the Doléris-Pellanda Technique.** (Conséquences obstétricales des ligamentopexies suivant la technique de Doléris-Pellanda.)
By J. GONNET. *Rev. franç. Gynéc.*, **43**, 27-34, Jan. 1948.

1388. **Sarcoma Botryoides Vaginae, Complete Excision of the Tumour in an Infant by the Combined Abdominal and Perineal Approach.**
By H. ULFELDER and S. H. QUAN. *Surg. Clin. N. Amer.*, **27**, 1240-1245, Oct. 1947. 5 figs., 4 refs.

A sarcoma botryoides vaginae in a girl of 26 months was treated by radical excision of the uterus and vagina through a combined abdominal and perineal approach. Such radical surgery is justified by the low rate of distant metastases in reported cases and by the high recurrence rate when local excision is performed alone or combined with radiotherapy.

Preoperatively radiological examination was carried out to exclude metastases; penicillin was given intramuscularly for 24 hours, and a transfusion of 250 ml. of blood was started preoperatively and carried on throughout the operation. The diagnosis was confirmed by finding malignant cells in a vaginal smear. A right paramedian incision was used, the Fallopian tubes and ovaries were conserved and the uterus and upper two-thirds of the vagina removed *in toto*, with ligation of the uterine vessels at their origins and careful separation of the bladder and ureter in front and at the sides, and of the rectum at the back. The pelvic peritoneum was reconstructed and the abdominal wound closed. With the patient in the lithotomy position a deep perineal incision was made for exposure, and the remainder of the vaginal wall removed; this wound was packed and a catheter tied into the bladder. Postoperatively streptomycin and sulphadiazine were used to prevent infection; the catheter came out spontaneously on the sixth day and normal micturition began on the thirteenth day, but catheterization for residual urine was still necessary several months later.

The tumour was pedunculated and not invasive. There was a covering of squamous epithelium over a mass of spindle cells with large pale nuclei and acidophilic cytoplasm, which ended in long thread-like processes blending with other cells. Other

spindle cells showed faint striation suggesting imperfect muscle fibres. There were also myxomatous areas.

[More details of preoperative and postoperative care would have been useful. It is not clear why streptomycin was used at all.] *Hugh R. Arthur*

1389. **Vesico-vaginal Fistula.**

By B. W. TURNER. *J. Urol.*, **58**, 359–366, Nov. 1947. 3 figs., 33 refs.

This paper is devoted mainly to the advocacy of the vaginal approach in the treatment of practically all forms of vesico-vaginal fistula and some uretero-vaginal fistulae. After comparison with transvesical methods, the author gives a description of the technique which he has found most satisfactory in 27 cases of vesico-vaginal fistula treated at the Texas Urological Institute, Houston, Texas. This embodies a preliminary examination to detect any extraneous defects or complications and to establish the presence or absence of multiple fistulae. Fistulous tracts and adjacent tissue must be in a healthy state, free from cancer extension, granulation, radiation reaction, and slough, and the function of both kidneys must be adequate before operation. Preoperative preparation includes sulphonamide and penicillin therapy together with the administration of vitamin C and oestrogens.

At operation the exaggerated lithotomy position is employed, and the bladder drained by continuous aspiration through a urethral catheter. Dissection is begun circumferentially around the fistula, and episiotomy performed if necessary to improve access. As the dissection proceeds the various planes of vaginal mucosa, vaginal fascia, vesical muscle, vesical fascia, and vesical mucosa are clearly identified and freed. After horizontal suture of the vesical mucosa has rendered the bladder watertight, the most important part of the operation is carried out. This consists in raising a buttress or bridge support composed of the muscle and fascial tissue, again in the horizontal plane, by means of two rows of sutures inserted in such a manner as to avoid apposition. Finally, the vaginal fascia and mucosa are closed with interrupted nylon sutures placed well out from the edges of the incision.

A petrolatum gauze dressing is left in the vagina for 24 hours, and thereafter the vagina is cleansed daily with cotton swabs. An indwelling No. 20 Malecot catheter is retained for 15 to 18 days, being changed every fifth day to reduce the tendency to incrustation. The nylon sutures are left in place for 21 days. No case histories are given, but in every instance in which the prerequisites of a successful result were present, the fistula was closed in one operation.

[The abstracter considers the author's condemnation of transvesical methods to be somewhat dogmatic. No indication of the size of the fistulae is given, and the methods advocated by MacAlpine (*Brit. med J.*, 1940, **2**, 778) and Twombley and Marshall (*Surg. Gynec. Obstet*, 1946, **83**, 348) for dealing with large defects are not mentioned.] *J. D. Fergusson*

1390. **A New Technique for Treatment of Vesico-vaginal Fistulae by the Vaginal Route.** (Nueva técnica para el tratamiento de las fistulas vésicovaginales por via vaginal.)

By E. BELT. *Rev. esp. Obstet. Ginec.*, **7**, 45–51, Jan.-Feb., 1948. 8 figs.

1391. **Treatment of Vesico-vaginal Fistulae.** (Tratamiento de las fístulas vésicovaginales.)

By S. D. FONT. *Toko-ginec. pract.*, **7**, 73–79, Feb. 1948.

1392. **Transplantation of the Levator Muscles in the Repair of Complete Tear and Rectovaginal Fistula.** [In English.]

By A. INGLEMAN-SUNDBERG. *Acta chir. scand.*, **96**, 313–316, Feb. 28, 1948. 4 figs., 9 refs.

1393. **Two Cases of Inversion of the Uterus Treated by Anterior Abdominal Hysterotomy. (Author's technique.)** (Dos casos de inversion del útero, tratados por colpo-cérvico-histerotomia anterior abdominal. (Técnica de autor.))

By J. OCEJO. *Rev. méd. cubana*, **58**, 427–442, June 1947. 8 figs.

The author reviews fifteen different types of manipulative and operative treatment of inversion of the uterus carried out by the vaginal and abdominal routes, and then describes in detail his own technique. He distinguishes between acute, subacute, and chronic inversion. In acute inversion immediate replacement should be performed before shock develops or there is much haemorrhage; it is nearly always successful. If there is shock without haemorrhage, anti-shock treatment is carried out and manipulation postponed. If haemorrhage continues, packing is tried; if this fails, vaginal taxis is attempted, and if this is unsuccessful rapid abdominal operation is performed. In subacute inversions the initial risk is over, but infection and slight haemorrhage may occur. The patient's general condition must be improved by such measures as blood transfusion, and infection treated with penicillin and the sulphonamides and by local vaginal methods, including packing with iodoform gauze, which may even result in spontaneous reduction. In chronic inversion there is no sign of infection or tendency to haemorrhage, and operation is always necessary.

In both of the author's cases operation was carried out 2 months after delivery. After opening the abdomen and packing off the intestines, he applies Allis forceps to the constricting ring behind the round ligaments. The fold of utero-vesical peritoneum is then incised, and the bladder pushed down extensively off the vagina, as in the Wertheim operation. With one blade of the scissors in the depression a midline incision anteriorly is made through the constricting ring into the vagina.

The fundus is then replaced in the abdomen with the fingers and re-inverted. This is possible without force, and the incision can be enlarged upwards or downwards if necessary, though it should not be unduly long. After the surgeon has changed his gloves, the incisions in the uterus and vagina are closed in two layers, and a small gauze drain is left in the lower part of the wound projecting into the vagina. The incision is completely covered over by the utero-vesical fold of peritoneum, and a ligamentopexy of the Doleris-Gilliam or Crossen-Gilliam type carried out. This operation is rapid, bloodless, clean, and easy. It can be carried out whenever the state of the uterus permits of its conservation, but if gangrene or severe infection is present a hysterectomy is essential. There is little bleeding, because the incision is in the midline of the uterus. The ligamentopexy and covering of the incision with peritoneum prevent the spread of infection into the abdomen and also any recurrence or retroversion. Owing to the level of the incision in the uterus the risk of rupture of the scar in a subsequent pregnancy is not great. Both of the author's patients made good progress. One of them has since had 5 pregnancies, one of which ended in premature labour after an accident, but all the others were uneventful and labour was normal.

Bryan Williams

1394. **Labhardt's Operation in the Treatment of Genital Prolapse in Elderly Women.** (L'opération de Labhardt dans le traitement des prolapsus génitaux chez les femmes âgées.)

By J. MATHIEU. *Rev. franç. Gynéc.*, **43**, 21–26, Jan. 1948.

1395. **Vaginal and Uterine Prolapse.** (Il prolasso delle pareti vaginali e dell'utero.)

By T. NOBILE. *Ginecologia, Torino*, **14**, 49–64, Feb. 1948. 11 refs.

1396. **Controversial Details of Complete Hysterectomy.**

By H. O. JONES. *Texas J. Med.*, **43**, 688–690, Mar. 1948.

1397. **Hysterectomy of Election in Benign Conditions.** (Indicação eletiva da histerectomia nos processes benignos.)

By A. P. DE QUEIROZ. *An. brasil. Ginec.*, **25**, 17–32, Jan. 1948. 21 refs.

1398. **Hysterectomy for Fibroids Followed by Perivesical Abscess (? Ureteric Injury).** Histerectomía por fibromioma seguido de flemón perivesical (? Por lesión de uréter).)

By S. DEXEUS FONT and I. ORSOLA MARTI. *Med. esp.*, **19**, 23–25, Jan. 1948. 1 fig.

1399. **Reflex Anuria after Hysterectomy for Fibroids.** (Anuria secretora, refleja, consecutiva a histerectomía por fibromioma uterino.)

By I. ORSOLA MARTI and S. DEXEUS FONT. *Med. esp.*, **19**, 110–116, Jan. 1948. 2 figs., 8 refs.

1400. **New Data on the Treatment of Sequelae of Castration.** (Neues zur Therapie der Kastrationsfolgen.)

By A. SAURER. *Schweiz. med. Wschr.*, **78**, 197–199, Mar. 6, 1948. 2 figs., 6 refs.

1401. **The Evaluation of the Results of Carcinoma of the Cervix Uteri Treated by Radical Vaginal Operation.**

By S. MITRA. *Amer. J. Obstet. Gynec.*, **55**, 293–298, Feb. 1948.

1402. **Plastic Operations for Sexual Ambiguity. (Gynandrynes and Androgynes.)**

By G. COTTE. *J. Mt Sinai Hosp.*, **14**, 170–174, Sept.-Oct. 1947. 3 figs.

This is a technical account of operations performed on three patients with malformations of the genital tract, commonly classed as constituting hermaphroditism. Two of the patients had functioning ovaries and a normal though small uterus. The vagina was absent in both cases, at least on external examination. In fact, a small vagina communicating with the perineal portion of the urethra was present. Both patients had the instincts and external characteristics of a female, but owing to the masculine though poorly developed appearance of the genitals one had been brought up as a boy until the age of 16 years, when the menarche occurred. Plastic operations succeeded in exposing the vagina and establishing a vulval cleft. One patient subsequently had two normal pregnancies, but both infants were delivered by Caesarean section.

The third patient had been brought up as a female but was in fact a cryptorchid male with hypospadias, whose atrophied testes had been removed 4 years earlier during operation for bilateral inguinal hernia. Plastic operation on the perineum to give it a more feminine aspect and to provide a pseudo-vagina was performed with the full knowledge of her marriage partner.

M. Baber

1403. **Plastic Operations for Ambiguity of Sex.** (Opérations plastiques pour ambiguité sexuelle (gynandres et androgynes.)

By G. COTTE. *Rev. franç. Gynéc.*, **43**, 1–11, Jan. 1948. 7 figs.

1404. **Problem of Ureter Implantation per vaginam.** [In English.]

By L. LAJOS. *Gynaecologia, Basel*, **125**, 1–8, Jan.-Feb. 1948. 13 refs.

1405. **Perineal and Vaginal Total Cystectomy.**

By B. S. VALLETT. *Delaware med. J.*, **20**, 6–7, Jan. 1948. 2 refs.

1406. **The Treatment of Urinary Stress Incontinence by the Implantation of a Tantalum Plate.**

By M. A. GOLDBERGER and A. M. DAVIDS. *Amer. J. Obstet. Gynec.*, **54**, 829–837, Nov. 1947. 6 figs., 16 refs.

The authors, having tried various methods of repair for the relief of stress incontinence with not entirely satisfactory results, have now resorted to the use of a tantalum plate fixed in position beneath the proximal third of the urethra and the urethro-vesical junction. In 18 cases the immediate result was completely satisfactory. The tantalum plate, which is 0.004 in. (0.01 cm.) in thickness and " of proper length ", is stitched to the periosteum on the inner aspect of the descending rami of the os pubis by means of a tantalum suture 0.015 in. (0.0375 cm.) in diameter. Because the distance between the pubic rami varies in different patients it is necessary to use plates of different length. The size most often used was 1¼ in. (2.85 cm.) in length and 5/16th in. (0.75 cm.) in width. No foreign-body reaction has been observed in the tissues as a result of the implantation of the metal. The purpose of the plate is " to provide a permanent fixed posterior urethral plane ". It reinforces the weakened urogenital diaphragm, thus preventing the extension of the bladder cavity into the proximal portion of the urethra. Cystograms are reproduced to illustrate this point.

G. Gordon Lennox

1407. **The Fascial Sling Operation for Incontinence of Urine.**

By J. V. MEIGS. *J. Mt Sinai Hosp.*, **14**, 504–514, Sept.-Oct. 1947. 3 figs., 11 refs.

The author describes his sling operation for the cure of stress incontinence. The main difference from the Aldridge operation is that the urethra is pulled up higher and there is no break in the continuity of the fascia. The author has performed the operation 19 times; in 10 the result was excellent, in 3 good, in 2 fair (incontinence persists at night). In 4 the operation was not successful; 2 of the patients are neurotic and it was difficult to assess their answers to questions. In another of these 4 failures an abscess formed after operation and drained through the vagina. The other failure was in a diabetic patient, in whom cystoscopic examination showed that the fascial sling was holding up the trigone but that there was bulging of the urethra below. *Gladys Dodds*

1408. **The Difficult Case of Stress Incontinence.**

By T. L. CHAPMAN. *Glasgow med. J.*, **29**, 49–52, Feb. 1948. 6 figs., 1 ref.

1409. **Persistent Cloaca in the Female: Report of Two Cases Corrected by Operation.**

By O. S. LOWSLEY. *J. Urol.*, **59**, 692–707, Apr. 1948. 12 figs., 8 refs.

Miscellaneous.

1410. **Massive Intraperitoneal Haemorrhage due to Torsion and Rupture of an Embryoma in a Girl of 8.** (Inondatiòn péritonéale par torsion et rupture d'un embryome chez une fillette de 8 ans.)

By A. DESCAMPS. *Brux.-méd.*, **28**, 823–826, Apr. 18, 1948.

1411. **Another Case of Amputation of the Fallopian Tube Caused by Torsion of a Cyst.** (Novší prípad amputácie tuby, zapríčineny torzious cysty.)

By E. DLHOS. *Bratislavské lekárs. List.*, **28**, 127–129, Feb. 1948. 1 fig., 1 ref.